China's Energy Security:

The Strategic Value of Co-Opetition

and the Heritage of *Hehe* Culture

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Abstract

In the 21st century, increasing demand for energy stimulated by high rates of economic development has pushed China to increase imports, leaving the country highly dependent on foreign energy sources. China's energy security is therefore under threat from the constant risk of supply falling short of demand. Historically, various approaches have been proposed to attempt to resolve or, at least relieve, this security issue but those discussions focus on either competition or cooperation. The combined approach, co-opetition has been applied in business and this research has attempted to combine these two approaches when dealing with energy security issues, thus the original contribution of this research is to take a unique approach, combining the co-opetition approach with the added benefits of a traditional Chinese philosophy known as '*Hehe* culture'. In addition, the 'Chinese characteristics'inherent in the energy security strategy, advocated by the Chinese government, has contributed a specific viewpoint in the academic field. Moreover, this research employs the PARTS model from game theory, an analytical tool originally applied in the field of business and economics, to build a framework for evaluating Chinese co-opetition in energy relations. Three case studies of China's energy co-opetition with Japan, Russia and Africa are analysed according to the framework, revealing how co-opetition

affects China's energy security. The findings of this research include the prerequisites for successful co-opetition, and the value and function of incorporating *Hehe* culture into co-opetition. The research identifies the impact of these prerequisites on the strategic value of co-opetition, generating a new model for Chinese energy security, which will allow for accurate determination of the best approach to the game of energy co-opetition with different players.

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List of Acronyms

ACD	Asian Cooperation Dialogue
APEC	Asia-Pacific Economic Cooperation
API	American Petroleum Institute
ASEAN+3	Association of Southeast Asian Nations Plus Three Cooperation
ASPO	Association for the Study of Peak Oil and Gas
BFA	Bo'ao Forum of Asia
BoS	Game of Battle of the Sexes
BP	British Petroleum
CDM	Clean Development Mechanism
CIS	Commonwealth of Independent States
DG	Dictator Game
ESS	Evolutionarily Stable Strategy
ESPO	Eastern Siberia Pipeline Oil
GAO	United States Government Accountability Office
GCC	Gulf Cooperation Council
IEA	International Energy Agency
IEF	International Energy Forum
IR	International Relations
METI	Ministry of Economy Trade and Industry of Japan
MNC	Multinational Corporation
MOSES	Model of Short-term Energy Security
NGO	Non-Governmental Organisation
NTS	Non-Traditional Security
OAPEC	Organisation of Arab Petroleum Exporting Countries
OECD	Organisation for Economic Co-operation and Development
OPEC	Organisation of Petroleum Exporting Countries
R&D	Research and Development
RPR	Reserves-to-Production Ratio
SCP	South Caucasus Pipeline
SPR	Strategic Petrol Reserves
SSA	Sub-Saharan Africa
SINOPE	China Petroleum & Chemical Corporation
WEC	World Energy Council

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I have spent four long years engaging in this research, and it has been four of the best years of my life. However, I cannot deny that I have encountered considerable challenges in the research process. Sometimes I lost the courage to continue, but I give thanks to God for giving me the encouragement and support I needed to keep going. I extend my sincere gratitude to my supervisors Dr Kirsten Haack and Prof Keith Shaw, under whose guidance I have been able to finish my thesis. They have given me so much assistance and support, shaping my progress throughout the duration of the research. I would also like to thank my friend Dr Joseph Hwang, who offered many invaluable suggestions and recommendations for my research; Professor Stephen Taylor and Dr Michael Barr, who provided professional and helpful advice on my draft paper; Miss Nicola Dean and Miss Victoria Le Grove, who helped considerably by proofreading the whole thesis; and finally Mr Yulei Li and Miss Jin Guo who looked after our whole family and helped me find the time and space to carry out my studies. Thank you to everyone who has helped me during these four years; without you, I would not have been able to finish.

Declaration

I declare that the work contained in this thesis has not been submitted for any other award and that it is all my own work. I also confirm that this work fully acknowledges opinions, ideas and contributions from the work of others.

Any ethical clearance for the research presented in this thesis has been approved. Approval has been sought and granted by the University Ethics Committee.

I declare that the Word Count of this Thesis is 89,267 words.

Name: Shan Shan

Signature:

Date: 16/11/2015

Chapter One: Introduction

Energy plays a fundamental role in the performance of everyday activities, meeting the residential, commercial, industrial and transportation needs of both people and the state in developed and less-developed countries. (Ryding, 1998) Brown (2002:5) explains that energy is 'the capacity to do work and is available to us in various forms and from many different sources.' From a more dynamic perspective, energy can be transformed into different forms and supplies basic material resources. Such is the crucial importance of energy, that terms for natural resources, such as oil, gas, biofuel, electrical power and hydropower have entered the vernacular, not only in academia but also across the media.

A review of recent editions of *World Energy Outlook* reveals at first glance that the prominent and unchanging trait of current world energy, especially for oil and natural gas, is the instability of the balance between energy demand and actual or potential energy supply.[1] In other words, the principal problem affecting world energy is that, over extended periods of time, energy supply cannot meet increasing demand. There are three major factors contributing to this dilemma: imbalanced energy allocation and consumption,

[1]Comparing and contrasting the energy outlook from 2010 with that of 2013, it suggests that in major energy consumption areas, such as Europe, Asia-Pacific and North America, there is a continuing need to rely on energy imports to meet ever-increasing demands. Although the initial success of shale gas extraction in the United States has relieved the pressure on gas imports, this cannot resolve the reliance on foreign oil. In other words, though energy supply is mostly able to meet current demands, there is a constant risk that supply will fall short. For more on this, see (IEA, 2010; 2011b; 2012b; 2013) .

[2]The concept of *Hehe* culture will be examined comprehensively in Section 2.3.

increasing demand for energy, and decreasing levels of energy production.

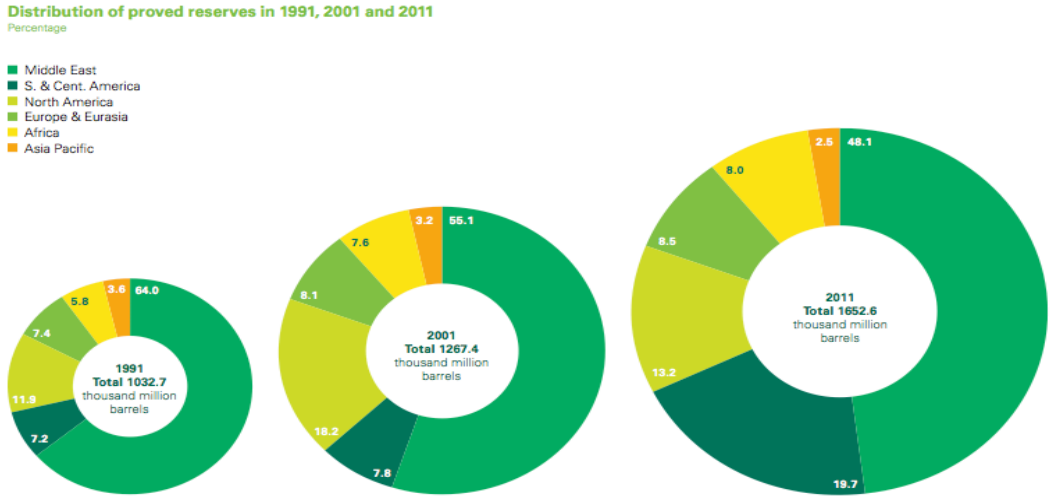

Figure 1: Distribution of Proven Oil Reserves in 1991, 2001 and 2011 (BP, 2012c:7)

First of all, imbalanced energy allocation, or distribution, is one of the key factors in terms of the unstable balance between energy supply and demand. For example, Figure 1 compiled by BP (2012c:7) presents the imbalance of oil distribution in the world. The Middle East accounts for the largest proportion of oil allocation, followed by the Americas, and then Africa and Eurasia. Other non-renewable fuels, such as coal and natural gas, share a similar distribution to oil, with the most abundant reserves being found in the Middle East, Russia, North America and Africa. But, with greater exploration, the discovery of fuel reserves in the African continent is on the increase. In addition to this imbalance in the distribution of fossil fuels, there is also an imbalance in the usage of non-renewable sources of energy. The BP statistical reviews of world

energy from 2011 to 2013 (BP, 2011; BP, 2012c; BP, 2013) show that the consumption of nuclear energy and hydroelectricity are mainly distributed across North America, Europe and the Asia-Pacific region, whereas the Middle East and Africa report little usage of these energy types. In other words, due to these vastly different geographical distributions of energy, different countries are forced to take different approaches to energy.

Further to the imbalance of geographical distribution, the imbalanced consumption of different energy types also influences the shortfall between energy supply and demand. Figure 2 shows that in early 2005, the IEA calculated that the demand for fossil fuels – coal, oil, and natural gas – accounted for by far the largest proportion of energy consumption worldwide. Figure 3 shows the IEA go on to predict that this would remain the case by 2030, and that oil would actually account for an even greater proportion of total energy at that time. (IEA, 2005) Although it was predicted that the proportional usage of renewable energy would be on the increase, it was also predicted that it would still lag far behind fossil fuels. In some cases, the use of renewable energy had, in fact, been unprecedented. For instance, consumption of nuclear energy in the Asia-Pacific region had reached 18% of the region's total energy use, but by 2013 this had declined suddenly by 89% compared with 2011, as a consequence of the Fukushima incident. (BP, 2013) In other words, predictions on the use of renewable energy may be unreliable as the usage of these energy types remains unstable over long periods of time.

Overdependence on fossil fuels, on the other hand, is a steady and predictable trend. This high dependence on traditional non-renewable resources poses a significant danger to state actors, but according to the Department of Trade and Industry of Great Britain (2012), this high reliance will continue in the short-term, bringing higher risk to those countries which depend on the import of energy.

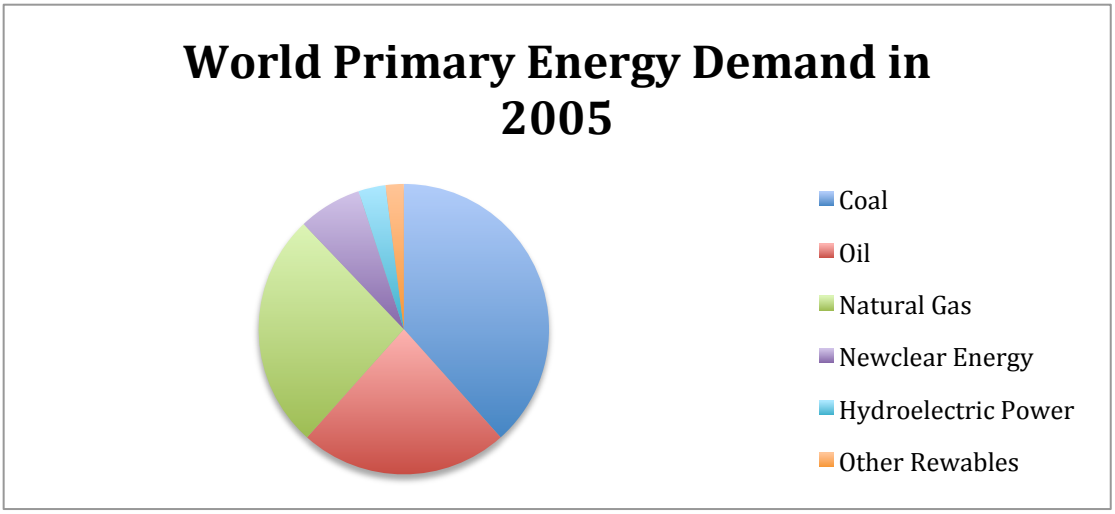

Figure 2: World Primary Energy Demand in 2005 (Pochettino, 2005:3)

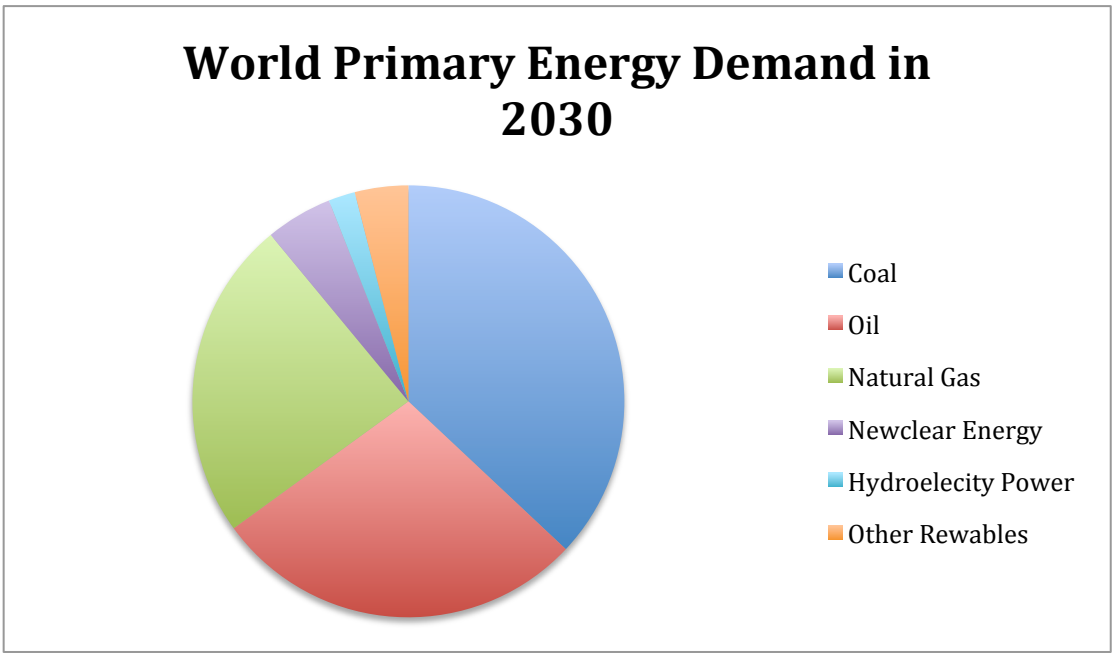

Figure 3: Predicted World Primary Energy Demand in 2030 (Pochettino, 2005:3)

Another factor affecting the stability of the relationship between supply and demand is increasing rates of energy consumption. A 2011 IEA report calculates that energy consumption will increase by 53% of 2011 levels by the year 2035. (IEA, 2011b) Various aspects contribute to increasing levels of production, one of the main aspects being the growing world population. As Tester et al. (2005) corroborate, as a result of the growth in world population and the requirements of expanded development, world energy consumption over the next century is expected to increase by a factor of four. Besides this, Moan and Smith (2007) explain that in the past 150 years, alongside a boom in population, there has been an exponential growth in global energy consumption. That is to say, with such a rapidly expanding population, it is

almost inevitable that world energy consumption will increase.

The second factor, which has influenced the relationship between the supply and demand of energy, is overexploitation or even depletion. This exploitation has led to the situation of instability, due to changes in both energy consumption practices and energy production levels, and as a consequence, people worldwide will be forced to face the challenges of an energy shortage. As Clarke (2008) points out, the gap between energy demand and supply has widened more than expected; a situation which has come about due to the continuous and often mindless exploitation of energy resources and the vast increase in energy consumption levels.

Changes in energy production are the third explanation for the instability of energy supply and demand. Hubbert (1949) predicted that the production of non-renewable resources would pass its peak and reserves would suffer from shortages in the early 1960s. In addition, Demirbas (2006) predicts that although levels of global oil production will continue to increase until 2015, oil production will most likely dramatically decrease after this time. Under such circumstances, it will be difficult to sustain current energy consumption, let alone face the increased consumption levels expected in the future, and thus ever greater uncertainty over energy is predicted. However, there are arguments that the balance between energy demand and supply may maintain equilibrium in the future. IEA (2005) predicts that the demand for oil will grow more slowly than expected increases in GDP; a situation that can

be explained by two factors. Firstly, population growth may slow down and plateau, resulting in lower demand than expected. Secondly, the wider use of natural gas and other energy resources may help redress the imbalance of supply and demand.

The above three factors demonstrate the imbalanced relations between energy supply and demand caused by various situations. However, in recent years, the global energy situation has dramatically changed. That is not to say that demand and supply have balanced; rather, new factors are beginning to play a part in the situation. Previously untapped energy reserves are being explored and exploited, including fields in Africa and Russia. Meanwhile, development, and therefore also energy consumption, are on the rise in developing economies, particularly massive powerhouses such as China and India. As a result, as the IEA (2013) explains, the new geography of demand and supply means the re-ordered global oil trade is flowing towards Asian markets, with implications for cooperative efforts to ensure oil security.

In fact, faced with these new global energy flow patterns, the implications for different countries and regions vary greatly, both for suppliers and consumers of energy. Firstly, the leading role of the Middle East, traditionally the world's most important energy supplier, is under threat due to the discovery of new oil fields. Meanwhile, due to the success of shale gas, North America's dependency on oil from the Middle East has been reduced.

This is pushing the Middle East to shift the focus of its oil trade from North America to the Asia-Pacific market. (Jones et al., 2014)

Another energy abundant country, Russia, has a different role in the world market. Russia has largely focused on finding new partners. According to Goodrich and Lanthemann (2013), Russia currently supplies a third of Europe's oil and natural gas, but is starting to export more to the energy-hungry East Asian markets. In addition, Russia plans to explore further oil and natural gas fields and push ahead with pipeline projects in order to cope with the large demand from the Asian markets. (Chen, 2008)

The considerations for the African continent are different yet again. Although many African countries possess significant energy reserves, underdevelopment of technology means that exploitation remains difficult. Despite abundant reserves, the lack of ‘a well-trained labour force, managerial skills, necessary investments, and modern technology’ prevents the full employment of these resources. (Bahgat, 2011:126) For Africa, the most important consideration in terms of energy is the creation of possibilities for increased exploitation of existing reserves.

In terms of energy-consuming countries, a recent report from the U.S. Energy Information Administration (2014) clearly points out that the United States may be in a position to stop importing oil by 2037 due to the abundance of domestic crude supplies. The U.S. also plans to become a net natural gas exporter in the following 10 years. If the United States is successful in this

endeavour, the country's dependency on the Middle East for oil will become negligible.

In stark contrast to the United States' moves towards increasing energy independence, dependence on foreign oil is rising in South Asia and East Asia due to rapid economic growth, with China and India at the fore. As Downs (2004) states, China became a net importer of oil in 1993, ending three decades of self-sufficiency. China has now become the second largest oil consumer in the world after the U.S. and demand continues unabated. (EIA, 2014)

It is important to identify why the application of co-opetition in China is a particular cause for concern when dealing with energy security. In this newly drawn-up energy pattern, energy supply still cannot meet demand and it is of global significance that China - a rising power and one of the most important actors in world energy consumption due to its fast development and considerable population - is currently expending great effort to gain a firm foothold in the uncertain struggle for energy. The intense energy situation is pushing China towards both competition and cooperation, by integrating all available resources including the economy, military, and environment to achieve energy diversity. On one hand, co-opetition reflects how China handles energy foreign policy with other countries, while on the other, co-opetition carries forward the *Hehe* culture spirit, which represents China's resolution to relieve energy security threats. Thus, this research will investigate

how the Chinese philosophy of *Hehe* culture[2] can be integrated into the concept of co-opetition to respond to China's energy security situation and provide a better understanding of how best to address China's energy security when covered in foreign academia.

Research Questions

How does co-opetition contribute to China's new concept of energy security under Chinese *Hehe* culture heritage?

Expanding on the primary research question, this research further encompasses three secondary research questions:

1. How does co-opetition integrate competition and cooperation in international relations?
2. How does the 'PARTS model'[3] shape the framework of co-opetition?
3. How does *Hehe* culture encapsulate co-opetition throughout the many transformations in Chinese strategies?

In order to answer these research questions, the research aims to construct an analytical framework by way of the literature review, which is presented in Chapter Two. The research will further comprise three case studies to support the assumptions of the analytical framework:

[2]The concept of *Hehe* culture will be examined comprehensively in Section 2.3.

[3]PARTS model is firstly proposed by Brandenburger, and Nalebuff, in 1997 in the book 'Co-opetition' Five elements (players, added value, rules, tactics and scope) will be explained in detail in section 2.2. (Brandenburger and Nalebuff, 1997)

(1). Co-opetition applied to the case of Sino-Japanese cooperation

(2). Co-opetition applied to the case of Sino-Russian cooperation

(3). Co-opetition applied to the case of Sino-African cooperation

This study will be conducted using analysis of primary resources. These resources will be focused around documental analysis of data, such as white papers of the People's Republic of China (PRC), national statistics, official governmental publications, and government speeches, as well as relevant archival documents in the field of international relations, energy security, and policy-making. After analysis of the collected data, it will be possible to consider the theoretical propositions proposed within this research.

1.1 Understanding Energy Security

Regardless of the actions of any states, the global supply of energy still cannot meet demand as it stands. This is the fundamental issue consistently plaguing global energy security. The origins of the conception of energy security as a major state policy can arguably be traced to Winston Churchill's historic decision to shift the power source of the British navy's ships from coal to oil. (Yergin, 2006; Su and Zhang, 2012) The originally vague notion of energy security was therefore hatched from an increasing desire for oil. Since then, the concept of energy security has been further shaped by the need to secure supplies, triggered in large part by the first oil crisis. (IEA, 2011a) Current

energy security norms were mostly created after the establishment of the IEA[4]. (Yergin, 2006)

It is important to stress that energy security is not limited to oil; it also includes other resources. For example, the IEA (2014:3) mentions: 'Secure supplies of natural gas and electricity are also 'of growing importance for keeping our economies and societies functioning.' Even so, oil is generally the most crucial focus in energy security policies, due to the extremely uneven distribution of world energy reserves[5], and previous oil crises experiences. Petroleum-dependent countries[6] are particularly sensitive to this and may be at risk of unprecedented or unpredictable threats caused by the shortfall in oil supply compared to demand. Further to this, oil has important applications in transportation and weaponry, amongst other fields, and alternative energy sources are often not suitable substitutes.

The importance of oil was noted as early as 1950. For example, Hoskins (1951:229) notes: 'In the contemporary world oil is power. It is power in times of peace to develop great industrial establishments, and to transport goods and passengers on land, at sea and in the air. Its value as an item of

[4]The International Energy Agency was established in 1973 in order to help release emergency oil stock and prevent a repeat of the first oil crisis, during which oil consumer countries had been caught off-guard. The concept of supply security was proposed with regard to assessing oil security, and subsequently, a publication series of the IEA focused on raising awareness of the importance of energy security.

[5]Energy reserves such as oil are mainly located in the Middle East, Africa, and North America, which leaves other regions with a less abundant supply and reliance on imports. (BP, 2012b)

[6]The term 'petroleum-dependent countries' was first coined by Choucri in 1976. (Choucri, 1976)

trade exceeds that of any other commodity. In times of war, oil is power to expand industry and to exert strength at great distances.' In fact, this example, though specifically highlighting the importance of oil, is also an apt reflection on the overall importance of energy security in global society. Nonetheless, it is clear that high dependency on oil, and particularly oil sourced from other countries and regions, carries significant risk, and it is for this reason that most research into energy security focuses on oil.

The major issue for both energy security research and policy is how best to balance or offset the relations between supply and demand. This inevitably draws on two different key perspectives – domestic and global. From a domestic perspective, current literature suggests that imperative actions in terms of energy security include, mainly: saving energy, securing energy transportation and exploring alternative energy sources in order to reduce over dependence on oil, coal or natural gas. Globally, the imbalance of energy distribution determines the interdependence between countries around the world. As a result of this interdependence and the trans-boundary nature of energy, countries have no choice but to concentrate on relations with other nations in order to meet their own energy needs. As Yergin (2006) explains, in the 21st century, energy security hinges on how nations manage their relationships with others. In other words, inter-state relations are a key focus of energy security research. Thus, this gave rise to the original aspiration to explore energy foreign relations in this study.

In general terms, the IEA defines energy security as obtaining energy source without the uninterrupted availability at an affordable price. (IEA, 2012a) Even this definition can be broken down into two separate points: sustainable supply and reasonable price. In order to evaluate the risk to supply, an IEA energy management conference declared that if oil demand exceeded 7% more than the supply at any one point, the supply could be seen as insecure, and interruption or disruption may occur at any time. (Houssin, 2004) Similar definitions of energy security centring on supply have been proposed, which also mention quantified measurements of energy security such as interruptions to energy supply and frequency of energy supply disruptions. (Wright, 2005; Winzer, 2012)

Along with the importance of uninterrupted supply, price is another inevitable consideration in the analysis of energy security. Martin (1996) argues that one of the main targets of energy security is to obtain adequate energy at a reasonable price to meet growing demand. The volatility of energy prices influences the imbalance between demand and supply and further affects the economy and markets. (Labandeira and Manzano, 2012)

Although securing both supply and price remain undeniably crucial concerns relating to energy security, changes in the international political environment and the natural environment consistently raise new risks for energy security, and this prompts the inclusion of ever broader aspects into the definition of energy security. For instance, recent research from the

Asia-Pacific Energy Research Centre (2007) raises the fact that energy security refers to whether the economic state is able to obtain sustainable energy resources within a reasonable price range under the premise of reducing environment pollution. Jansen (2009:9) touched upon this concept in his claims that energy security related to 'the extent to which the population in a defined area (country or region) can have access to affordably and competitively priced, environmentally acceptable energy services of adequate quality.'

Here, we find that the definition of energy security is undergoing development and growth, but the core nature of this issue – supply and price – has yet, and is unlikely to, change. Additions to the concept of energy security seem in large part to be incorporated in light of global environmental protection requirements under the umbrella of emissions reductions. These energy security dimensions closely tally with the idea of sustainable development. *Sustainable* in terms of energy security refers not only to environmental concerns, but also to the maintenance of a consistent supply. What's more, the addition of environmental concerns into the definition more specifically matches the concept of *long-term* energy security as given by the IEA (2012a:1): 'long-term energy security mainly concerns timely investments to supply energy in line with economic developments and environmental needs.'

Despite this nod to the importance of long-term energy security, it is more practical and immediate for states and other actors to focus on

short-term energy security. According to the Model of Short-term Energy Security (MOSES) announced by the IEA, short-term energy security attempts to measure energy security in terms of national scope, and helps countries to identify energy policy priorities by drawing up their own energy security profiles. According to the IEA, interrelated publications 'can serve as a starting point for studies of national energy security by providing a systematic, generic assessment framework that can be complemented by nationally relevant indicators and considerations.' (Jewell, 2011:6) Four dimensions are identified to indicate a country's energy security, namely domestic and external risk exposure and domestic and external resilience. The functions of each dimension are described in Table 1 overleaf.

Taking crude oil as an example, these indicators aim to measure the external risks of import dependence and the political stability of supply. Domestic risk is indicated by the proportion of offshore production and the volatility of domestic production. The quantity and quality of ports and pipelines as well as the diversity of suppliers represent external resilience, and domestic resilience is based on the average storage of energy supplies. The existence of these clearly outlined indicators can assist in better measurement and evaluation of state energy policy in order to achieve smoother coordination.

Table 1: Dimensions of Energy Security addressed in MOSES (Jewell, 2011)

	Risk	Resilience
External	External Risks: risks associated with potential disruptions to energy imports.	External Resilience: ability to respond to disruption to energy imports by substituting with other suppliers and supply routes.
Domestic	Domestic Risks: risks arising in connection with domestic production and transformation of energy.	Domestic Resilience: domestic ability to respond to disruptions in energy supply such as fuel stocks.

In terms of energy security, both long-term and short-term security are related to supply and demand. Besides this, the best-known threat dimensions that can influence energy security include the concept of peak oil, as well as geopolitical conditions affecting the oil trade. The Hubbert bell curve shows that production of fossil fuels will peak and then rapidly decrease; this is known as peak oil. (Hubbert, 1949) Campbell (1998) also claimed that the era of cheap oil prices would soon come to an end, which matched the Hubbert theory of peak oil and the increasing oil prices at the time. The establishment of the Association for the Study of Peak Oil and Gas (ASPO) represented a further development in the concept of peak oil. (Feng et al., 2006)

According to the peak oil curve, the continual exploitation of vast amounts of energy is speedily depleting the existing energy reserves around

the world. Fossil fuels will inevitably diminish and potentially disappear completely not too long into the future. Shafiee and Topal (2009:187) predict that coal reserves will be available until 2112, but that coal 'will be the single fossil fuel in the world after 2042.' According to the Department of Trade and Industry of Great Britain (2007), the rapid growth in global energy demands will only continue in the foreseeable future. Countries that depend on imported energy will be at elevated risk if supplies run short. Meanwhile, countries worldwide continue to rely on fossil fuel sources rather than renewable sources. Larson (2007) points out that 84% of U.S. energy is dependent on fossil fuel, 40% of which is oil. The reserve, production, and consumption of oil are at 3%, 10% and 20.5% respectively. Thus, it is vitally important to reduce the use of non-renewable fossil fuels and instead explore renewable energy options, in order to slow down the total depletion of all existing resources.

There is a suspicion amongst some observers that the claim that oil will soon reach a peak of production is merely a covert way to bring in a carbon tax so that certain nations are able to obtain benefits. The carbon tax policy[7] may influence the economies of developing countries in two main ways. Firstly, carbon tax may force economic structures in developing countries to change rapidly. For example, due to the large population and relatively low level of technology in China, the manufacturing industry has to engage a great deal of energy and resources. As Kahn and Yardley (2007) indicate, in 2006, the

[7]Carbon tax is defined as 'a tax on the use of fossil fuels in direct proportion to their CO_2 emissions.' (Hoeller and Wallin, 1991:7)

energy equivalent of 2.7 billion tonnes of coal was burned in China. The imposition of a carbon tax on China may drive the costs of its manufacturing industry to rise considerably, which would force China to change its industrial structure, potentially changing from labour-intensive industry to technology-intensive. Secondly, carbon tax may notably increase the level of unemployment in the developing world. As a result of rising production costs brought about by the imposition of a carbon tax, manufacturing companies would record lower and lower profit margins, leading to potential bankruptcy or layoff of staff. This would result in high rates of unemployment in developing countries dependent on manufacturing. These suspicions and controversy are furthered by the fact that the initial predictions for peak oil are yet to play out. In 2010, oil production was three times higher than predicted by Hubbert. (IEA, 2010)

In addition, according to the IEA 2012 world energy outlook report, the United States would become one of the largest oil-producing countries by 2020, and due to abundant shale gas, oil independence would be achieved in the year 2030. (IEA, 2012b) After the release of this report, it seems that these new opportunities put the possibility of resolving U.S. energy security concerns within reach. However, it is interesting that it is difficult to draw the same optimistic conclusion from the IEA 2013 world energy outlook report, which instead simply presents data on the enhanced percentage of shale gas and other resources. (IEA, 2013) How can the differences between the 2012 and

2013 reports be explained? The key point of contention is whether energy production levels have in fact arrived at a peak and will soon run out entirely, or whether this problem can be abated by the development of alternative energy sources.

Peak oil theory arguably neglects certain important factors. The first is the price effect, which shows negative relevance[8] with peak oil. The existence of incentive will continue to promote production even when supply cannot meet demand. Secondly, peak oil theory does not take into account improvements and new technological developments in the exploitation of energy. Shale gas is a good example. There is another additional factor which deserves consideration: the exploration of a new oil field brings with it a prohibitively high cost which must be borne, whether current supplies have dried up or not. Taking these developments into account, it can be premised that whilst the theory of peak oil does directly reflect the current condition of supply not meeting demand, this may well be a short-term phenomenon, and the case for long-term energy security remains difficult to predict and analyse.

Another important dimension of energy security is geopolitical oil. Geopolitical debates over energy security are mostly centred on the importance of geographical location. The uneven geographical distribution of fossil fuels pushes world energy into ever-fiercer competition and affects both

[8]I.e. when production increases, prices will decrease, and when production decreases, prices will increase.

those states that produce energy and those that import resources. Mackinder (2012) states that, owing to the abundant resources available, if one nation builds up sufficient structure to utilise these energy sources to their advantage, potentially at a cost to other states, it could result in dramatic conflict. That is to say, the more resources a country has, the more conflict it may face. The competition over oil in the Middle East and the ensuing conflicts it has raised is an example to evidence this point. For oil-rich countries, the most important factors to consider are therefore seeking reliable, secure customers and ensuring stable political conditions.

Reserves also tend to be amassed in certain locations. According to Larson (2004:10), 'two-thirds of the world's known oil reserves are in the Middle East.' Besides the Middle East, another area of intense competition is the Caspian Sea region. It is believed that there may be massive reserves of oil and natural gas in and around the Caspian Sea, giving the region the capacity to produce at much higher levels than at present. (Gelb, 2005) Effimoff (2000) predicts that there are approximately 236-337 trillion ft^3 of reserves in the Caspian Sea region, which is similar to the amount of North American reserves at 300 trillion ft^3, and larger than all of Western Europe, which stands at 168-242 trillion ft^3. The oil production in Kazakhstan, which borders the Caspian Sea, is likely to exceed 3 million barrels per day by around 2015. (Davis et al., 2003) According to BP (2012b), the proven natural gas reserves in Turkmenistan, another bordering nation, measure 858.8 trillion

ft^3, accounting for 11.7% of total global reserves. Tolosa et al. (2004) note that, since the dissolution of the Soviet Union in 1991, those nations encircling the Caspian Sea, in possession of rich natural gas and oil reserves, have attracted a great deal of attention from the oil and gas industry.

The data demonstrates that the Caspian Sea region has great potential for significant future exploitation. In other words, the Caspian Sea has become of immeasurable significance in terms of energy reserves. This brings with it the spectre of inevitable competition and conflict. Relations between countries become more sensitive as a result of the added factor of energy. There is a distinct possibility that the focus of the US, one of the largest and most powerful energy importers, will turn to the Caspian Sea, perhaps creating further tension. Croissant (1997) argues that current increasing levels of U.S. investment in the Caspian Sea region clearly show the U.S. expectation to play a positive role there. As noted by Kailcki (2001:121), 'American firms have already acquired 75%of Kazakhstan's mammoth Tengiz oil field, which is now valued at more than $10 billion.' In addition to capital investment, Kalicki (1998:146) claims that U.S. engagement 'covers a wide range of issues such as working to resolve regional conflicts, providing economic and humanitarian assistance, achieving the removal of nuclear weapons and promoting democracy and the rule-of-law.'

In terms of geopolitics, a further important debate is the issue of energy transportation. When competing over energy resources, countries also

have to consider the security of energy transportation. As Sahir and Qureshi (2007) argue, the key threat for energy security is not energy storage, but energy transportation, as this affects whether energy supplies can reach their destinations in a timely manner at reasonable prices. Winstone et al. (2007) state that researchers in the field of energy security should attempt to propose appropriate solutions to protect energy pipelines from various attacks. As areas of energy production and energy consumption are often geographically isolated from one another, the importance of energy pipelines may force both government policymakers and scholars alike to seriously consider how to protect energy pipelines, in order to ensure the security of supply. Secure transportation, needed to deliver energy resources from oil-producing countries to oil-consuming countries, is extremely crucial. In other words, geopolitics dictates the direction of oil pipelines and further influences transportation.

Geographical factors are an important issue in securing energy supply, as the nature of the terrain and recourse in a region may affect transportation choices. In fact, 60% of energy is delivered through maritime transportation, meaning that the geopolitics of the world's oceans and seas are crucial for energy security and are receiving more and more academic attention. One pertinent example relating to maritime transportation is that of the Spratly Islands. Sovereignty over the islands is hotly contested by Vietnam, Brunei, Malaysia, the Philippines and China, all of which hope to explore

energy exploitation possibilities around the islands. However, the location of the islands is also crucial to transportation. Sovereignty over the surrounding seas can help to secure the shipping lanes for said transportation. As Chen (2010) points out, 80% of China's energy comes through the nearby Straits of Malacca. In order to cope with the Malacca dilemma, the Chinese government has taken a series of actions, such as increasing the Chinese navy power in the strait, diversifying energy import sources and constructing alternative ports to avoid Malacca straits.

In conclusion, these different dimensions, including peak oil, geopolitical aspects, price, domestic and external risks and resilience influence energy security, but maintaining the balance between supply and demand is still the key. In addition, it is inevitable that conflicts will arise around supply and demand and therefore consideration of the relations between competition and cooperation cannot be avoided. However, the specific face of each country's energy security differs. With rapid economic development in recent decades, China's energy security has evolved over time. The following section will outline the situation in the 21st century.

1.2 China's Energy Security in the 21st Century

The growing discussion on China's energy security was officially written up in an official government paper in 2012, in the white paper of China's energy

policy. According to the Information Office of the State Council of the People's Republic of China (2012), the global situation of an imbalance between supply and demand also applies to China, and is the primary problem and emphasis of China's energy security. In the white paper, the issues of energy exploration, reservation, transportation, and emission reductions are also mentioned, and are considered secondary problems. However, as early as 2007, the Chinese government had already issued a white paper on China's energy conditions and policies. This paper, from the Information Office of the State Council of the People's Republic of China (2007), mainly introduces concrete energy conditions including various statistics on energy consumption and reserves in China, and pays relatively less attention to the threats facing China's energy security, or to how the Chinese government might cope with this situation. In fact, China's energy consumption is growing rapidly and demand is ever increasing due to incessant economic development, whilst total energy consumption continues to increase. Ma (2010) notes that, from 1952 to 2000, China's fossil fuel energy consumption rose by a factor of 26, and in those 48 years, the average annual growth rate was 7.08%. The average annual growth rate was as high as 10.72% in 2000 to 2007. In fact, in just the seven years from 2000 to 2007, China's total energy consumption growth was nearly the same as the previous 48 years.

In addition to the increasing levels of consumption, China is also troubled by imbalance in the consumption structure. China's fundamental

infrastructure and continuing industrialisation require a plentiful supply of energy, and coal has long dominated the Chinese energy structure and provided this fuel. China enjoys an abundant distribution of coal, and therefore relatively easy exploration, low prices and relatively secure transportation compared with other fossil fuel sources. (Ma, 2010) Ma (2010) calculates that China's total energy consumption equates to 2.655 billion tonnes of standard coal, which makes up 16.1% of the whole world's energy consumption. What's more, in 2002, oil only accounted for 23.6% of China's primary energy consumption structure, whereas the proportion of coal was as high as 67%. (Ma, 2010) This differs considerably from the world primary energy consumption structure, in which oil accounted for 39.9% and coal accounted for 27%. (BP, 2012c) This indicates that, within China's energy consumption structure, coal takes the leading position, while oil, gas and other hydrocarbon energy sources are relatively less significant.

However, under global demands for emission reduction, China has begun to alter the primary energy structure away from coal, increasing oil demand during recent years, with considerable knock-on effects for both China's and the world's energy security. It is predicted that China may depend on foreign oil for 66% of its fuel supplies by 2020 (Pang, 2013), which is particularly risky in terms of transportation security. As Yu (2010) explains, 85% of China's oil imports must pass through the Straits of Malacca; if there is any hindrance to the safe passage of energy supplies, this could cause a massive

disruption to total energy supply, leading to a considerable crisis. What's more, as China is actively buying oil in the world markets, other countries may feel the threat of insecurity and act in response. Due to the increasing demand for energy fuelled by China's rapid development, and the significance of this energy to China's fundamental national security, understanding China's concrete energy situation can help understand China's foreign policy. China's energy security situation can be analysed from two approaches: internal challenges and external challenges.

China's Internal Energy Security Challenges

The first internal challenge for China is posed by decreasing energy reserves. The increase in the consumption of coal in recent years is likely to dramatically deplete China's domestic coal reserves. According to data supplied by BP (2012a), in 2001, China's consumption of coal was 809.5 million tonnes and by 2010, this had risen to 1797.9 million tonnes. This clearly shows the increasing amount of coal production in recent years. As Li and Liu (2009) state, the volume of coal exploitation in China has remained extremely high in recent years. They go on to state that reserves of coal may be at less than 15% of capacity and, as most reserves are located in rural areas, exploration and transportation can be relatively difficult.

In addition, the per capita, energy resources in China are relatively low. The Information Office of the State Council of the People's Republic of China (2007) notes that although the sum total of China's energy resources is enormous, the per capita average of energy resources is low due to the large population. For example, according to a report by BP (2012c), at the end of 2011, the proven energy reserves in China were calculated at the equivalent of 14.7 billion barrels of oil. According to the National Bureau of Statistics of China (2012), the population of China in 2010 reached 13.3 billion. Thus, energy resources are only around 0.85 barrels per capita. By way of comparison, BP (2012c) states that the U.S. has 30.9 billion barrels of proven reserves, whereas the population of the U.S. is 314 million. (United States Census Bureau, 2012) Thus energy resources in the U.S. come in at 98.40 barrels of oil per capita, nearly 116 times more than per capita resources in China. Thus, the low per capita energy reserves in China constitute another potentially severe problem that the Chinese government must acknowledge. In addition, in terms of energy reserves, China's strategic reserves fall far below the strategic reserve maintenance standard of IEA members, which need to meet 90 days net import in a year. (IEA, 2012a) According to data released in 2013 (Qi, 2013), China's current reserves would be used within 42 days.

The second internal challenge for China's energy security is increasing energy needs. China is undergoing a process of fast development and industrialisation. According to the World Bank (2011), since 1995, China

has been developing rapidly and the Gross Domestic Product (GDP) has reached 5.879 trillion U.S. dollars. Even if, as Rawski (2001) claims, the official Chinese statistics contain exaggerations of output growth beginning in 1998, there is still no doubt that China's economic development is having increasing knock-on effects across the globe. However, with this rapid economic development, the demand for energy also increases. Chang et al. (2003) point out that large-scale economic development requires considerable amounts of energy supplies, and Cunningham (2009) warns that the speed of China's GDP growth must not be too rapid, as it is a feat which requires a massive input of energy resources. Increasing domestic demand for energy has pushed China into increasing supplies through imports.

The third big challenge that China must confront is the environmental destruction and pollution caused by the consumption of fossil fuel resources such as coal. What's more, according to Li and Liu (2009), the burning of coal, China's major fuel resource, may create much more air pollution than oil and natural gas. China is therefore encouraged to reduce emissions and decrease the usage of fossil fuel. Moreover, China's economic development is also challenged by the tense pressure of emission reduction quotas. As Chan and Yao (2008) explains, the urbanisation of the Chinese population and the emergence of considerable metropolises have given rise to a dramatic increase in energy consumption, which in China's energy consumption structure, means an increase in the combustion of coal, oil and natural gas. As

a result of these concerns, as Che et al. (2002) notes, it can be extremely hard for China to develop its economy on the one hand, and protect and conserve the environment on the other. The dilemma between the economy and the environment creates an unavoidable but weighty challenge for China.

China's External Energy Security Challenges

The first external challenge for China's energy security is the instability of China's major oil suppliers. China's oil imports are mainly from the Middle East and Africa. It had been predicted that, by 2010, 76% of China's consumed oil would be imported from the Middle East. In fact, the Middle East's oil is vital to China's economic development and its diplomatic-superpower status. (Salameh, 2003) The Chinese government's energy white paper of 2007 discusses the transformation of China's energy suppliers. Due to the instability in the Middle East, China has begun to increase cooperation with other countries, such as African states. (Information Office of the State Council of the People's Republic of China, 2007)

Meanwhile, conflicts over offshore oil exploration between China and other countries can be seen as the second key external challenge to China's energy security. This is mainly caused by disputes about sovereignty over the seas. China has had various running clashes with other countries, on issues such as maritime demarcation, sovereignty of surrounding islands, and rights

to resource development. One example is the oil and gas exploration in the South China Sea. According to Baker and Wiencek (2002), geologists predict that the South China Sea is rich in energy resources such as natural gas and oil. The dispute here mainly refers to the Spratly Islands (known to the Chinese as Nansha Islands). The major claimants include Vietnam, Brunei, Malaysia and the Philippines. In addition, Baker and Wiencek (2002) continue to explain that some claimant developing countries, such as Vietnam, 'have a strong need for reliable and inexpensive energy sources to sustain their future economic development', increasing the intensity of their fight for national security. The East China Sea is another current dispute relating to exploration for energy. A famous example of this is the ongoing dispute over the Senkaku Islands (Diaoyu Islands). Like the South China Sea, the East China Sea is 'one of the last unexplored high-potential resource areas located near large markets.' (Valencia, 2007:127) Owing to this, territorial disputes in this region are as strained as those over the South China Sea. For example, as Valencia (2007) elaborates, even though China and Japan signed an agreement on joint approaches to the exploitation of hydrocarbons in the East China Sea in 2008, the two countries have very different understandings of what this joint development implies. Intensification in this difference of opinions could easily escalate into the destruction of this positive element of Sino-Japanese relations.

The third external challenge for China's energy security relates to highly risky transport channels. The latest data demonstrate that 51.2% of China's imports are from the Middle East and 24.4% from Africa, and that these supplies are transported by sea. (Bahgat, 2011) Furthermore, Zubir and Basiron (2005) note that most of China's shipping lines run through the Straits of Malacca. According to Alon and McKee (2006), the Straits of Malacca can be considered the most dangerous shipping lane in the world due to widespread piracy in the area. A massive problem in the Straits of Malacca is maritime terrorism. Raymond (2006) stresses that the importance of the Straits of Malacca has led many countries to become involved in the region, potentially leading to increased risk of clashing interests. In sum, piracy and terrorism in the Straits of Malacca in particular may have a considerable influence on the security of oil imports from the Middle East and Africa to China. As a result, in a white paper as early as 2004, the Chinese government proposed enhancing the strength of the navy in order to protect marine sovereignty and transportation. (Information Office of the State Council of the People's Republic of China, 2004)

In conclusion, China's energy security is influenced by both internal and external risks, and this analysis is corroborated by the government's own energy white paper. These challenges in particular will form key parts of the analysis in the case studies presented in this research. On the one hand, China's energy situation requires domestic policies focusing on saving energy,

reducing CO_2 emissions, establishing strategic energy reserves, altering the consumption structure and exploring alternative energy. On the other, China, whilst guaranteeing more energy imports from more suppliers, also needs to improve cooperation with other countries to collaborate on advanced energy-related technology, including new energy, energy reserve exploration, maintenance of reserves and exploration of offshore sources. In other words, China's major energy security strategy will address the primary issue that supply cannot meet demand, whereas other tactics are focused on the secondary issues troubling Chinese energy security, namely energy exploration, reserves, transportation and emission reduction. These secondary issues and solutions contribute to relieving the major issue of supply and demand. The following case study chapters will analyse China's energy relations by taking into account both the primary and secondary problems and policies of China's energy security, and will show that the co-opetition approach can combine both competition and cooperation to address these issues.

1.3 The Nature of the Research

Energy has the inherent trait of being trans-boundary and distributed asymmetrically. As such, interdependence between countries is inevitable, as it is not possible for one country to be able to resolve its energy

security-related problems entirely on its own. This interdependence dictates the necessary existence of common interest. However, conditions of pure competition would only lead to unreasonable allocation of energy, and market turmoil and finally, loss of common interest. Therefore, policymakers are faced with the dilemma of having to competitively obtain energy with no effect on conflict and instability outcomes. China's traditional philosophy and current strategies and policies have generated a leaning towards the establishment of co-opetition in energy security.

Co-opetition is known as *jinghe* in Chinese, which has become a commonly used term. However, use of the word 'co-opetition' in Western literature is more rare particularly in work relating to politics. The earliest expression of the co-opetition concept in fact appeared in the business world, focused on enterprise theory and transaction costs theory. (Huang, 2011) In business, the existence of complementors[9] provides the foundation for a strategy of co-opetition, and can significantly influence its rate of success. A pertinent example could be the alliance between a car sales company and a car insurance company. Any enhancement in car sales could also bring more profits to the insurance company.

In 1997, the pioneers Brandenburger and Nalebuff first proposed this new business mindset of co-opetition. The term 'co-opetition' is a *portmanteau* of *competition* and cooperation, which stems from cooperation diversification

[9]An actor is your complementor in business if customers value your product more when they have the other actor's product than when they have your product alone.

concepts whereby two or more involved parties maintain a relationship balanced between competition and cooperation. (Brandenburger and Nalebuff, 1997). This can be seen as a strategy of 'survival of the fittest' in terms of competition, and a search for a better way of co-existence in terms of cooperation. In short, co-opetition in business is a way to 'make the pie bigger.' Brandenburger and Nalebuff state that the key factor behind building a strategy of co-opetition is seeking a common interest that can help businesses (or nations) work together for mutual benefit. That is to say, in order to develop co-opetition, players or nations should at least have a potential common value.

Brandenburger and Nalebuff (1997) also warn that the pie will, ultimately, be divided up. Furthermore, what you can get 'does not depend just on the size of the pie to be divided. Nor does it depend just on how well you play. What you get depends on your power in the game as well as on the power of others who have competing claims on the pie.' (Brandenburger and Nalebuff, 1997:14) In order to achieve success in this strategy, Bengtsson and Kock (2000) believes that game theory can offer a theoretical framework for co-opetition. However, as this research focuses primarily on the appropriateness of developing co-opetition in China's energy security approach, rather than the theoretical implications of co-opetition itself, a detailed analysis of game theory is beyond the scope of this thesis.

Theories behind competition and cooperation being used together also exist in politics, but they focus on states, not companies. If companies can

implement co-opetition, why not states? This research considers what might happen if the concept of co-opetition were applied to international relations in general, or even more specifically, to energy security. One of the important reasons for choosing co-opetition to analyse energy security is that the energy market has similar traits to the general business world, largely due to the existence of common interests. Frankly speaking, the debate over whether co-opetition can lead to mutual benefit or success has not yet reached a decisive conclusion. Nonetheless, in terms of energy security, pursuing co-opetition can allow China to draw advantages from both competition and cooperation. Establishing an understanding of the different factors at work within co-opetition can lead to concrete tactics for approaching relations with the different players with whom China will inevitably engage in order to resolve national energy security. Chapter Two in particular will address co-opetition within international relations, and then attempt to demonstrate how a situation of co-opetition can be achieved within the field of energy security specifically.

As Hillman and Hitt (1999) state, the establishment of any policy is based on an orientated strategy, and the prerequisite for the formulation of this strategy is that it both suits the national environment and safeguards the interests of the state. In this sense, this study is inspired by the recent rise of China – in terms of economics, global military and the environment, which are related and integrated into energy security – and considers the guiding strategies behind China's energy security. This new global power undoubtedly

needs to pay close attention to securing benefits through the maintenance of security, whether traditional or non-traditional in nature. It is thus of global significance that China is currently expending great effort on energy security strategies.

Methodology

Various methods exist in social science, but case research will be employed in this thesis. As Bhattacherjee (2012:40) notes, ‘case research is an in-depth investigation of a problem in one or more real-life settings (case sites) over an extended period of time. Data may be collected using a combination of interviews, personal observations, and internal or external documents.’ Thus, as stated in the above sections, the aim of this research is to investigate the relations between co-opetition and traditional Chinese culture applied to energy security through different case analyses. Bhattachejee continues to explain that ‘the strength of case research is its ability to discover a wide variety of social, cultural and political factors potentially related to the phenomenon of interest that may not be known in advance.’ (Bhattacherjee, 2012:40). Thus, data collection in this research will be based on internal and external documents, such as Chinese governmental documents, white papers, news and foreign documents. Besides this, as Porta and Keating (2008) explain, much research in social science research, especially in political science, is case- orientated which offers in-depth description of a few

instances of a certain phenomenon. As a result, the aim of this research is to use different cases to illustrate the application of co-opetition in China's energy foreign policy.

However, the choice of cases is not easy. As George and Bennett (2005:9) explain, 'a crucial case is one in which a theory that passes empirical testing is strongly supported and one that fails is strongly impugned.' In other words, choosing comparative cases is important for the findings and analysis. In this research, the three cases are Japan, Russia and African countries and the thesis will be developed through a thematic analysis under the umbrella of each theoretical assumption outlined in Chapter Two. Cases are selected in two ways. First they are considered for their comparability. Japan is an important rival of China in the Asian market due to the similar demand for energy. Therefore, competition between China and Japan is much more intensive than it is between China and other countries. But the situation with Russia is different to the situation with Japan. Competition has also existed between China and Russia due to having found themselves in different circumstances in different times. Although Russia is deemed an important supplier to China, the relationship is smoother. At the same time, compared with Japan and Russia, the fact that the Sino-African relation is also different with Sino-Japanese or Sino-Russian. That is because the historical Sino-African relations are different to historical Sino-Japanese and

Sino-Russian relations, because Sino-African has maintained positive relations since the establishment of new China.

Second, cases are considered in terms of how they respond to the PARTS model, in order to demonstrate the application of co-opetition on energy. Generally, these three players are quite typical in the discussion of relations with China under the PARTS model, because of their relatively simple energy situations. In other words, when choosing other cases, such as the U.S or Middle East countries, more variables need to be considered due to the complex energy position, such as the influence on energy price relations. Thus, a diagram of the inter-relationship between these sections is shown below so that you may further understand how I employ the methodology, which is appropriate for fulfilling the aim of this research.

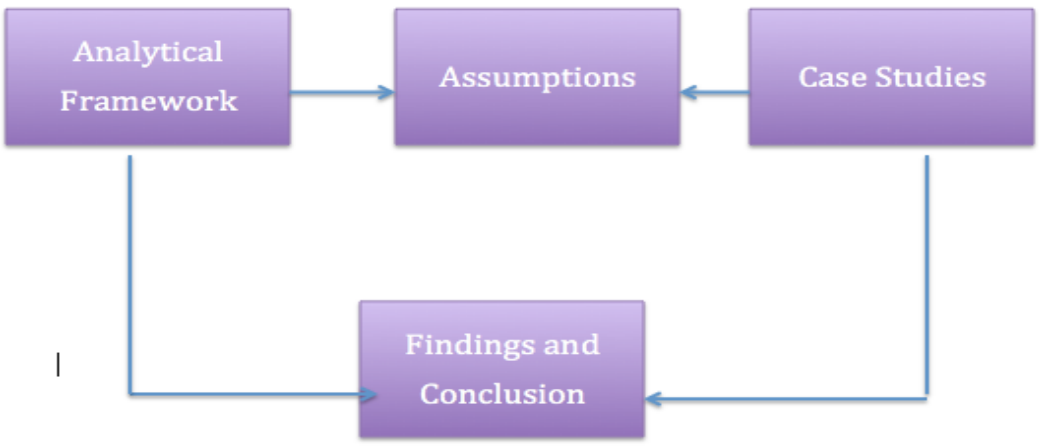

Diagram 1: Inter-relationship between the analytical framework and case studies (Researcher's own)

This thesis must be as prudent and objective as possible, in spite of the limitations that exist. One limitation is the evidence from government sources. Evidence from government sources is deemed reliable and solid, but on the side, the government only publishes what it allows the public to know. Therefore, in order to overcome this limit, I have attempted to balance Chinese government sources with others sources, such academic literature, journals and news, from both China and abroad.

Another limitation is the choice of cases. On one hand, this is an energy security study - not any other study - and consequently the selection of cases may be different to those selected when conducting military studies, for example. On the other, comparative relations between two cases decide the orientation of the cases. That is to say, any change in conditions between two cases will influence the final findings and analysis.

Outline of thesis

Chapter two will present a theoretical examination of co-opetition, including an analysis of the nature of co-opetition and discussion of the PARTS model from game theory and how it applies to co-opetition. In this chapter, the concept of co-opetition is described as an analytical tool to the case studies in this research, in order to establish how the concept works for China in specific cases. Compared with traditional literatures, this research offers a new platform for energy security based on integration fuelled by interdependence.

Here, interdependence does not only mean making the pie bigger, but it more widely refers to integration of the economy, military and environment Thus, focus on the interdependence helps generate four assumptions. Namely, international organisations play an important role in interdependence in co-opetition; interdependence in co-opetition comes not only from military aspects, but other aspects too; building trust in co-opetition has become much more difficult due to the existence of interdependence; interdependence has created difficulties in dividing the pie. Furthermore, co-opetition presents a reasonable conceptual solution for resolving the issues identified within energy security through game theory. Competition is inevitable while cooperation also exists. This chapter also summarises another five assumptions through deconstructing the PARTS model of game theory. These five hypotheses are that: co-opetition can exist between two asymmetrical players; high-degree complementarity can compensate for the limitation in asymmetrical players; establishing commitment and reciprocity can help achieve co-opetition; tactics in co-opetition rely on states; co-opetition requires step-by-step supervision from international organisations.

Besides this, all the assumptions will be addressed by proceeding from an investigation to the basis of strategy and the relations between co-opetition and traditional *Hehe* culture. Understanding the role and influence of *Hehe* culture in Chinese foreign policy can form an interpretation of the rationality behind China's commitment to co-opetition. The application of *Hehe*

culture to co-opetition on energy generates a new model for China's energy security approach, which comprises certain unique 'Chinese characteristics.'

Chapter Three begins by analysing the concrete development of China's energy policies in different state leader eras. This chapter will delve further than the preceding chapter into investigating how co-opetition is applied to China's energy polices and evaluate how these policies influence China's energy security. This chapter also provides the theoretical evidence for the application of co-opetition in the following cases. China's foreign energy policies are based on the state's foreign policies overall; in other words, China's energy policy progress is an indication of the development of foreign policy as a whole. *Hehe* culture is inextricably woven into China's foreign policy stance, and therefore into the energy security strategy specifically, further emphasising the importance of *Hehe* culture in the application of co-opetition.

Chapter Four is the first case study, which discusses how co-opetition influences China's energy security with regard to the energy relations between China and Japan. First this chapter introduces Japan's energy situation, then it moves on to discuss the historical development of Sino-Japanese energy relations. The similar requirements for energy mean that China and Japan cannot cooperate with each other very smoothly. Instead they are bogged down in intense competition. The PARTS model suggests that symmetrical players in the game have the same needs and therefore compete directly with

one another. This leads to irreconcilable conflict in energy imports and exploration. Although there is cooperation between China and Japan on energy, such as with energy reserves and emission reduction, Japan still has the active advantage in these projects and this lopsided cooperation cannot last long, even if there is some economic complementarity. The establishment of commitments between China and Japan is another important factor in deciding long-term co-opetition. Casting aside the player and added value factors, it is the lack of trust between the two countries that causes the difficulties in establishing commitments. In short, no matter what kind of tactics are employed, it will not be possible for a bilateral energy mechanism to exist. Regardless of how the two players work together, the difficulty of establishing co-opetition between China and Japan due to the symmetry of their resources and situation cannot be overcome. The case between China and Russia in Chapter Five is in direct contrast to that between China and Japan. Although co-opetition progress between the two players has been slow and drawn-out, it has been developing more rapidly recently, particularly during the Hu Jintao era.

On one hand, this suggests that co-opetition can exist between Russia and China; this would be decided by their asymmetrical resources, high degree of complementarity in different fields, and step-by-step commitments. On the other hand, China is the weak partner in this dyad when it comes to energy, and the absolute advantage of Russia, the producer

country, silences China's opportunities for negotiation. China needs to locate and develop complementary advantages in order to bridge this gap. In terms of scope, given co-opetition has existed continuously between China and Russia, it is feasible that either a bilateral or multilateral energy mechanism would be suitable for the development of Sino-Russian energy relations.

Chapter Six presents the case study of China and Africa, and also demonstrates a positive example of the application of co-opetition to energy relations. First the chapter introduces the energy situation in Africa, then it analyses the historical development of Sino-African energy relations through different policies in different eras. The case is analysed according to the PARTS model, which indicates the feasibility of co-opetition between the two asymmetrical players, but notes the low degree of complementarity in other fields. The trend in Sino-African co-opetition has generally been fast and smooth, but not without challenges. There is a potential difficulty in the establishment of firm commitments, and the Chinese government is also forced to reconsider its concrete actions in cooperation with Africa, in particular to respond to accusations regarding the China energy threat and neo-colonialism in Africa.

The significant *Hehe* culture heritage is an important factor which must be considered throughout all three case studies. How does *Hehe* culture feature in the co-opetition between China and different partners, and what role

has it played in energy co-opetition thus far? This will be reviewed in the final chapter, taking into consideration insights from the three case studies.

Chapter Two: Co-opetition within Game Theory and the Heritage of Chinese *Hehe* Culture

As discussed in depth in Chapter One, the fact that energy supply cannot meet demand is the biggest energy-related challenge in the world today. The issue of energy becomes securitised after it is politicised, and is closely linked with the interest of states. In order to maintain the interest, states have to co-opetite with other states by integrating the military, economy and environment. Thus, this chapter will illustrate how the combination of competition and cooperation within the concept of co-opetition can promote a useful approach to energy security. On the one hand, co-opetition can achieve the effective integration of world energy, and on the other hand, it incorporates the three important fields of the economy, military, and environment; this reflects how energy security differs from traditional security. In addition, this co-opetition may hypothetically involve co-opetition between two countries with power asymmetry, and require step-by-step supervision from the international community in order to succeed. Furthermore, this co-opetition could well involve the integration of energy resources, allowing states to achieve the benefits of balance and stability through mutual energy supplementation.

This chapter will first introduce the concept of co-opetition, which includes the definition of co-opetition in business and the reasons for following

a co-opetition strategy. It will then go on to present an analysis of the application of co-opetition within the scope of international relations, proposing theoretical and conditional assumptions for the successful establishment of co-opetition, and then comparing and investigating how co-opetition can integrate energy security. Taking this into account, the chapter will then put forward the features of co-opetition within the scope of game theory. Game theory provides the practice of co-opetition from the analysis of business and extends it to political science. In order to investigate the conditions of successful co-opetition, a theoretical co-opetition model based on game theory will be drawn up. In addition to the dimension of game theory, this chapter also puts forward the classical Chinese concept of *Hehe* culture. This philosophy can be seen to closely reflect the concrete realities of co-opetition as a natural development of traditional cultural practice and explain the unique strategic value of co-opetition in China's energy security.

2.1 The Nature of Co-opetition

Historically, co-opetition was first applied to business management. However, this does not mean it cannot be put to use in other fields, including political science. The existence of competition and cooperation can be identified in political science, manifested particularly in the two extremes of peace and conflict. There is a clear link between the two fields in this regard; understanding the application of co-opetition to business is also useful for

analysing co-opetition in political science.

2.1.1 Co-opetition in Business

Co-opetition is a portmanteau of competition and cooperation, and the theory originates from management studies. According to Yami et al. (2010), the neologism *co-opetition* stemmed from two different research approaches. The first approach saw players engaged in a game involving both competitive and cooperative aspects. The second looked at the nature of opponents and rivalry within alliances.

Firstly, Bengtsson and Kock (2000) write that when a company simultaneously cooperates with a counterpart in some activities but competes in others, this can be classified as co-opetition. Secondly, literature on alliances has also contributed to the conceptualisation of co-opetition. For example, Harbison and Pekar (1998) note that even within an alliance, competitive tensions still exist. Rivals, especially direct rivals, may draw more individual benefits than the common interests of the alliance through a strategy of co-opetition. (Khanna, 1998) That is to say, the relationships amongst alliances, conflicting interests and common interests exist at the same time. Thus, as Brandenburger and Nalebuff (1997) note, the aim of co-opetition is to make the common interest (pie) bigger before dividing it up. Although the methods of dividing the pie differ, both streams of research suggest that the

‘game of co-opetition involves simultaneous engagement in cooperative and competitive relationships.

Further to this, Bengtsson and Kock (2000) and Walley (2007) classify co-opetitive relationships into three types – cooperation-dominated, equal, and competition-dominated – according to the different proportion of cooperation and competition present. Although these three different types derive from business studies, the classification can also be taken into account when analysing the behaviour of states engaging in co-opetitive relationships, as different proportions of competition and cooperation may result in different outcomes.

Co-opetition can be readily identified in the business world and the strategy has been welcomed. Hamel et al. (1989) noted that even in the 1980s, collaboration between competitors had already become fashionable. Hamel et al. (1989) also explained that previously, the established principle when analysing business practice was to approach cooperation and competition independently, generally with a focus on either one or the other. However, the development of economy and technology has continuously increased the possibilities for competitors to cooperate. For instance, the invention of the Internet affected the competitor strategy in many different regions. The fact that the boundaries of industry have blurred dramatically in recent years has granted former competitors the chance to work together in a less competitive domain. (Bamford et al., 2003)

Meanwhile, game theory shows the potential benefits of co-opetition because the ambitious aim of the game is to provide a universally applicable theory of conflict and cooperation. (Binmore et al., 1993) In other words, traditionally game theory involves the two aspects of competition and cooperation, as does the concept of co-opetition itself.

As Luo (2007) states, co-opetition is expected to result in a positive-sum outcome. Spangler (2003) defines the term *positive-sum* as when the sum of winnings and losses is greater than zero. A *zero-sum* situation, on the other hand, is when one party obtains benefits with a corresponding loss for the other party. (Spangler, 2003) Thus, it can be said that positive-sum seeks to build a win-win relationship whereas *zero-sum* can only create either win-lose or lose-lose relationships. (Chandra and Kumar, 2000) With an emphasis on positive-sum, co-opetition aims to generate profit for all partners within the game, a benefit which motivates both competitors and scholars to rethink the feasibility of cooperation between former rivals. (Zineldin, 2004)

There are many inherent benefits – as well as limitations – to co-opetition. Firstly, as pointed out by Luo (2004), co-opetitive behaviour aims to make markets bigger, allowing rivals to access an even bigger pie. Ideally, the bigger the pie, the more generous the slices for all those engaging in co-opetition. However, there is a fairly high probability that one or more participants will take a bigger share than others. According to Dagnino and Padula (2002:31), diverse competitive pressures may weaken the co-opetitive

structure, causing partners to attain ‘mutual but not necessarily fair benefits.’ The issue of fairness can become a key problem when dividing up the pie. Nevertheless, solutions such as formal agreements before the co-opetition can help ease this problem. (Brandenburger and Nalebuff, 1997) In terms of International Relations (IR), this potential solution seems particularly suitable and will be considered in more detail in Section 2.2.1.

A second benefit that rivals may obtain from co-opetition is cost efficiency. Stabryła (2012) notes that coordination can result in huge cost savings. Co-opetition enables competitors to share both costs and risks, reducing the high price of entering or developing a market individually. (Luo, 2004) However, it can conversely be argued that costs often cannot be reduced as much as expected. One of the possible reasons for this is the cost of cooperation itself. Co-opetition requires partners to cooperate to make the pie bigger, which may involve an unanticipated outlay. Frank (2003) argues that there is a distinct possibility of costs rising if parameters change. For example, a lack of trust between rivals may dramatically increase the cost of cooperation. (LeTourneau, 2004) This higher cost will also bring higher risk for both sides. (Min et al., 2008) Zineldin (2004) reiterates that partners should not only consider the monetary aspects of a given venture, but also the hidden costs of a close relationship.

A third major benefit of co-opetition is enlargement of the economy of scale, which is important in the business world but can also be feasibly

extended to IR and energy. (Stabryła, 2012) Gnyawali and Park (2009) argue that small and medium-sized enterprises engaged in co-opetition are likely to benefit from the economy of scale. A further benefit is potential access to superior technology. Co-opetition can enable competitors to obtain access to technology they could not afford individually by sharing the costs of development, such as licence fees. (Meyer, 1998) What's more, earlier access to technology and information is highly beneficial to partners for reducing their time-to-market. (Gnyawali et al., 2006) Nevertheless, co-opetition can raise other risks: as Piranfar (2011) points out, partners should be very careful to avoid losing technological secrets and proprietary knowledge to other players.

There are many other potential benefits and costs of co-opetition. Zineldin (2004) mentions that engaging in co-opetition can help enterprises achieve higher levels of R&D (Research and Development) and add greater customer value. However, higher dependence on other parties or an inferior co-opetitive relationship may cause unpredicted problems. Despite these risks, the limitations of co-opetition can generally be resolved by application of certain solutions, and the fact that co-opetition pursues positive-sum outcomes continues to attract many pioneers in the business world and, increasingly, further afield. As Kość (2012) notes, like enterprises in the world of business, countries or regions frequently simultaneously compete and cooperate. It is therefore a natural step to apply the concept of co-opetition to the field of international relations, and to energy in particular.

2.1.2 Co-opetition: An Inevitable Integration of World Resources

Although there is no conclusive definition for all forms of co-opetition, co-opetition in business refers to the simultaneous existence of competition and cooperation within a relationship. Another take on this is that co-opetition is cooperation which arises out of competition when the circumstances and timing benefit the participants. Either way, both stress the coinciding of cooperation and competition. When applied to international relations, once again the key point of co-opetition is simultaneous cooperation and competition between actors such as states or regions. More specifically, in terms of global energy, co-opetitive strategies may be applied to the relationships between and across consuming and producing states. In the book *The Oil Decade: Conflict and Cooperation in the West*, Lieber (1983) describes the cooperation and competition prevalent in the relationship between energy-consuming countries from the viewpoint of international relations. He argues that strategies to reduce dependence on oil or compete over exports are ineffective strategies, as unilateralism offers few benefits when faced with the global energy crisis. In other words, attempting strategies of co-opetition can be more feasible given the circumstances.

Within this study, co-opetition is considered to be a relationship involving the greatest integration of energy interests between states, touching on not only how countries are able to obtain and maintain immediate interests,

but also how long-term interests can be achieved by increasing integrated common interests. In short, co-opetition is seen to be a potential strategy for achieving energy integration.

Examples from Russia show how co-opetition can bring about the integration of energy. As Turson and Abulati (2004) explain, the Russian oil corporation, Lukoil, obtained exploitation rights over three essential oil fields in Kazakhstan. According to the IEA (2010), Russian exports of crude oil have reached 5430 thousand barrels per day until 2010. It can be seen that this cooperation is a form of integration which supplies more potential for energy exploitation and maintenance of production levels. Primarily, although Russia and Kazakhstan are ostensibly rivals in the market, both Russia and Kazakhstan have been able to obtain more interest for themselves through trans-boundary cooperation.

Another example is the interdependence of the European Union member states and Russia. As Elder (2009) points out, around a quarter of the European Union's natural gas is imported from Russia. As much as two thirds of Finland 's total energy products are imported from Russia. (Vahtra and Lorentz, 2004) In other words, Russia is an important partner for Europe, and Europe is a major buyer for Russia. 70% of the sales of Russian energy resources hail from the European Union. (Leonard and Popescu, 2007) Russia's energy exports are significantly influenced by countries in the European Union. Russian state-controlled companies have created

partnerships with big companies in Germany, Italy and France, such as E.ON and GDF. (Leonard and Popescu, 2007) However, European countries are actively exploring other energy markets in order to relieve the over-dependence on Russia's gas. 'The over-dependence of certain member countries, as well as some post-Soviet countries, on Russian natural gas creates doubts on energy security.' (Bilgin, 2009:4482) According to BP (2012b), in 2011, Europe and Eurasia imported a total of 90.7 billion ft^3 of energy resources, mainly from Qatar (43.4 billion ft^3), Algeria (16.8 billion ft^3), Nigeria (15.7 billion ft^3) and Egypt (4.3 billion ft^3). (BP, 2012b) This shows that Europe has been able to secure suppliers other than Russia in recent years. This is to the detriment of Russia, who will suffer if European Countries transfer their custom to other suppliers. Although European countries are attempting to increase and diversify their suppliers in order to reduce dependence on Russian energy, they still continue to import from Russia, which creates a condition of co-opetition. What's more, due to the reduction from the European Union, Russia has had little choice but to consider alternative consumers, and has turned to the Asia-Pacific market. This is positive for both Russia and Asian countries. In other words, the only changed factors are the players in the game; energy can always find buyers, and a degree of energy integration can be achieved by co-opetition.

Further to this, co-opetition on energy effectively compensates for the deficiencies on both sides. As Winstone et al. (2007) claim, energy security

can involve the pressures of energy demand from the dramatic rise of developing countries such as China and India. These two large nations are both developing countries. Although some developing nations are rich in resources, there is no guarantee that they are abundant in the skills or technologies necessary to exploit their own reserves. According to Larson (2004), many other states may decide to exchange their technology or financial support for energy supplies in such countries. Lam (2006) suggests that China should take money and technologies to Africa and exploit energy there. However, as Kobrin (1985) notes, even though oil-producing countries need oil companies to help them exploit and manage the oil reserves on their land, the development in those countries enables them gradually attempt to control and participate in the oil markets more independently. As a result of these concerns, both oil-producing and oil-consuming countries must be aware of the importance of ensuring security under these conditions.

However, cases of technological or economic exchange for energy demonstrate a kind of integration, which effectively promotes complementary operations over resources and helps states rid themselves of the bondage of traditional energy concerns. Co-opetition can help achieve optimisation and integration of resources at both a domestic and international level. Waltz (2010) argues that the term *integration* should be used to describe the domestic situation of a state, and *interdependence* should be used for describing relationships between or amongst countries. By this reasoning, co-opetition

has provided an integrated platform for enlarging the pie due to the existence of interdependency Whereas the simple cases of Russia outlined above reveal clear cases of energy integration. Therefore this research considers co-opetition to be based on both interdependence and integration at both state and international levels.

2.1.3 Co-opetition: Shaping Energy Security within the Economy, Military and Environment

The factors which can influence energy security are various, but co-opetition in energy security integrates a range of aspects, including the economy, military and environment in particular. Energy security from the perspective of co-opetition is therefore different to traditional security. The fact that energy security, despite being a non-traditional type of security, interacts with these other types of security demonstrates that it does not exist insularly. Regardless of whether energy security is then considered through the lens of traditional security, or that of the more recently identified No-Tradational Security (NTS,) it has a significant and undeniable impact on national security.

Lippmann (1943:5) defined national security explicitly: ‘A nation has security when it does not have to sacrifice its legitimate interests to avoid war, and is able, if challenged, to maintain them by war.’ Within the realist school of international relations, states are the only actor within the international system,

and thus, security is equal to national security. Morgenthau (1995) argues that in the condition of world anarchy, the core and fundamental goal of national security is survival. Historically, national security has been seen as relating inseparably to territory. As Herz (1962) suggests, traditional national security is encapsulated in the concept of territory. A state is protected inside its territory by physical borders that may include natural boundaries like rivers, seas, and mountains. Luke (1997) writes that the territory of a state significantly influences its power. Those states with abundant resources may attract aggression or occupation from other countries, and those lacking resources may be drawn into inevitable competition. These actions will also lead to territorial instability. Thus, the importance of territory to states and national security is vital.

The maintenance of national security, centred on the state, is the emphasis and the goal of Security Studies. (Zhao, 2006) States are the carrier of national security, and this national security is maintained and reflected by the military. Combining national security with the functioning of the military is logically reasonable. Jin (2002) posits that the function of the military is to safeguard state interests and uphold national independence, as well as to prevent infringements on sovereignty. Internally, the military protects national interests, and externally, the military prevents other states from carrying out threatening actions. (Zhao, 2006) Traditionally, scholars in the field of security consider national security to be paramount, and tend to believe that conditions

of security can be achieved only by military support. In fact, Knorr considers national security to be simply an abbreviation of national military security. (Knorr, 1973)

Feng et al. (2006) propose that, owing to anarchy in world politics, there is no eternal and absolute security for any country and the best way to obtain security is through the expansion of military power. Mearshimer (2001) is also in support of this stance, stating that as a nation depends on its military, it is important that the military is sufficiently large to handle threats hailing from other countries. Mohammed (1991) claims that the focus of national security is on external military threats. He believes that strengthening the military means directly strengthening security. The work of these many scholars points to a certain conclusion: in traditional security studies, there is an undeniable link between national security and the importance of the military.

In fact, all securitised threats, not just those directly associated with the military, can be said to fall under the umbrella of national security; this includes energy security. What's more, aside from whether or not it falls into a type of non-traditional security, a strong argument can also be made that energy security makes up an important part of traditional security, due to the link between the military and energy. Energy provides power to the military and can influence military expenditure[10]. Energy is the fuel for new military

[10]Silience in energy systems), Supply (accessing alternative and renewable energy sources available on installations), Sufficiency (providing adequate power for critical missions), and Sustainability (promoting support for the Army's mission, its community, and the environment)

innovation and can supply the necessary power for a modern military platform. From another perspective, Booth and Vale (1994) suggest that states are no longer the target of security, but the tools to maintain the security. Following this, it can be asserted that states can in fact provide security for energy, particularly through the harnessing of state military power.

Some commentators still consistently argue that military security will always occupy the most significant position in national security, for example because it supplies a fundamental guarantee of territorial integrity and security of individuals. (Hough, 2004) However, traditional national security has long focused on the military, and some scholars, such as Bull (1996), claim that too much focus on international relations from an antagonistic military perspective may lead to further conflicts between countries. Ullman (1983) posits that considering national security only from the level of the military may create inaccurate hypotheses, leading states to ignore more dangerous threats arising from different sectors.

It can thus be asserted that traditional literature has focused too much on military security and has overlooked other security types, including energy security. This does not mean that NTS is more important than military security, but new threats posed by the modern era may be beyond the scope of the military. (Brown, 1997) As Booth (1991) concludes, security research

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are the core characteristics defining the energy security necessary for the full range of Army missions (Way, 2012)

may benefit from breaking away from the leading position of realism, turning the emphasis away from the military towards non-traditional threats.

It has been argued that there is a clear division between energy security and military security, and that energy can be categorised solely as a non-military type of security, because the emphasis of military security is on a state's internal security, whereas energy security is trans-boundary and entails external links between different state actors. (Tickner, 1994) However, taking into account the shortage of energy reserves, the tense balance between energy supply and demand, and the intense competition in the energy market, the importance of energy security is elevated. Arguments supporting the unambiguous division between military and energy security are therefore somewhat overstated; there is no clear-cut boundary between the two. By this reasoning, energy security can be considered one integral aspect of national security, sharing the same degree of importance as military security.

Energy security is not only related to the military, but also to the economy. As the world economy continues to develop at a rapid pace, energy security seems to be becoming a more concrete concept, its definition continuously expanding. In a broad sense, according to Bielecki (2002: 237), energy security simply means an 'uninterrupted supply that fully meets the needs of the global economy' – at moderate prices. In addition, Barton et al. (2004:4) also specify that energy security entails: 'a nation and all…citizens and businesses [having] access to sufficient energy resources at reasonable

prices for the foreseeable future, free from serious risk of major disruption of service.'

Treverton (1981) attests that energy trading is not limited to the pattern of simple economic transactions. Although energy indeed is closely related to the development of the economy, on a deeper level it is also a political commodity. In this sense, energy trade not only needs to obey the regulations of the market, but it must also be subject to the decisions of the state. Under the circumstances of the current recession, as energy security is so strongly linked to the economy, energy security is perhaps more crucial than ever before. States cannot development economically without sufficient energy supplies. Therefore, both global and individual national economies may be dramatically affected by energy prices and availability.

As a result of the importance of economic interdependence, consideration of feasible solutions for the liberalisation of global energy markets is a valuable direction for the academic study of energy security. As Egenhofer and Legge (2001) state, in liberal markets, customers are able to switch between different suppliers and crucially, a competitive liberal market may enable customers to put some of their energy back into the market, potentially improving the security of energy supply for others. However, both energy-consuming and energy-producing countries take varying non-market actions to safeguard their own individual energy security, which leads to low information transparency and uninformed decision-making. (Stanislaw and

Cambridge Energy Research Associates, 2004) It is difficult to forcibly balance the energy market between consumers and producers. Liberal market forces may well supply this equilibrium.

Further to this, crude oil is a vital and fundamental energy resource for most industries; any increase in the price of oil will inevitably lead to an increase in the cost of many other products. Countries which depend on the manufacturing industry may have a higher reliance on oil than other countries and thus, a rise in oil price is most likely to restrain their economic growth. As Suntum (2005) notes, essential raw materials such as crude oil are most likely to draw the limits of economic growth.

The price issue is affected by the political situation in the producing countries. Iraq's oil production decreased dramatically after the Iraq war in 2003. (Kilian, 2008) As a result, OPEC countries had to increase production in order to stabilise the oil price. 'We find that a 10% increase in the probability of war has increased spot oil prices by about $1.' (Leigh et al., 2003:4) Stability of major energy-producing countries (largely a geopolitical issue) has crucial economic facets.

Following the shock of the first energy crisis in the 1980s, energy security referred simply to ensuring reductions in levels of consumer imports of oil, as well as risk management of oil prices and oil imports. (Wu, 2009) Martin (1996) explained that, as a result of the oil supply crisis, one much-discussed but narrow aspect of energy security was the shortage and break-off of the oil

supply in the Middle East. The IEA defines energy security, referring in particular to oil, as the ability to obtain the energy needed to meet demand at the lowest possible cost. A loss of economic welfare may occur as a result of a change in the price and availability of energy. (Manzano and Rey, 2012) Thus, during this post-crisis period, the fundamental key point of energy security was the smooth handling of the relationship between energy supply and demand, largely framed by economics.

Currently, the OPEC countries are important drivers behind decisions over oil prices. As the ‘world’s demand-supply balancer,’ OPEC's supply decisions can play an essential role in determining world oil price. (United States Government Accountability Office, 2005) IEA members have built up strategic reserves in order to handle any potential restrictions on supply by OPEC countries. One of the benefits of strategic reserves is the ‘avoided net import costs of oil. Net import costs can be simply defined as price times import quantity. When an oil price shock occurs, price rises and demand falls. Since oil demand is highly inelastic in the short run, the price rises more than demand falls and net import costs increase. The use of the emergency reserve in these circumstances reduces the price increase and the demand decrease. The combined effect is a reduction in net import costs.’ (Leiby and Bowman, 2000:5)

In addition to the price-controlling strategy of OPEC countries, threats to the stability of oil prices may also arise from non-OPEC countries, such as

Russia. Oil resources in Russia are abundant; according to the BP Energy Review Report, in 2001 Russia's daily crude oil production was roughly 6.65 million barrels. Russia's extensive exploitation of oil threatens the monopoly of OPEC and may inadvertently lead to confrontation. (BP, 2012b) The existence of more potential suppliers brings about a reduction in price. Consequently, OPEC countries have no choice but to reduce their prices in order to compete. However, the expense of Russian exploitation is higher than costs for the OPEC nations, so when global oil prices drop, influencing forex conditions, it is more harmful to Russia. According to account data, for every one U.S. dollar drop in oil prices, Russia will lose at least one billion in forex income. (Bahgat, 2003) As a result, raw competition between these two major producers will be harmful to both of them.

Transportation, a key aspect of energy security that was introduced earlier, is not only related to military security, but also to economic security. Rodrigue et al. (2009:45) outline three aspects of energy which may significantly affect transportation. These are the level and volatility of energy prices, and the 'technological and technical changes in the energy performance level of transport modes and terminals.' (Rodrigue et al., 2009:205) The most utilised energies for transportation, used throughout different industries, are still the three fossil fuels (oil, coal and gas). For example, for railroads, road freight and water transport, oil is the usual energy of choice. This extensive use of oil in industrial transportation leaves the

world's economy excessively sensitive to fluctuations in the price of oil, as any significant increases in price will drive up the prices of many basic products as a result of increased transport costs, with further knock-on effects on the price of most terminal products including food, fuel, and so on. As a result, Barrel and Pomerantz (2004:2) argue that oil prices can be powerfully linked to major growth in the global economy. They state that the price of oil can usually be seen as 'a trigger for inflation and recession.' According to this statement, explanations for the economic recession and significant inflation that most countries in the world have recently been suffering could conceivably be added to by considering changes in oil prices.

Environment is another dimension integrated into energy security that is relevant for co-opetition. For various reasons, energy is naturally associated with environmental security. For instance, as a result of the concern over oil supply, many countries have chosen to voluntarily set their own emission reduction goals, purportedly in order to fight climate change. A sweeping reduction in CO_2 emissions is now widely considered necessary for the protection and maintenance of the environment of this planet. Arrhenius (1896) explains that fossil fuels can be seen as a potential significant source of carbon dioxide. Furthermore, Lashof and Ahuja (1990) claim that CO_2 is responsible for 80% of global warming. Thus, a reduction in carbon dioxide emissions may relieve the pressure on the environment, and potentially halt the increasing global warming trend. However, the necessity for emission

reductions comes as the consumption and demand for fossil fuels increase. More CO_2, which may cause global warming, will be emitted into the atmosphere. All countries can be seen to have a responsibility for reducing emissions.

However, debates have arisen over whether developing or developed countries should take the responsibility for emission reductions. Developing countries maintain the stance that most of the existing pollution originated from the industrialisation of developed countries, and so developed countries should pay for this. However, the developed countries argue that all countries are located in the same world in the same time era, so whichever country now emits gas should pay for it. In other words, they hold the view that every emitting country has a responsibility for reduction. Eppstein et al. (2010) state that, after much negotiation, EU leaders have proposed reducing carbon emissions by at least 80-95% for the developed world by 2050. In addition, in 2005, the United States set its own emission reduction targets at a 30% reduction by 2025 and a 42% reduction by 2030 (UNFCCC). China promises to reduce emissions by 40-50% by 2020. It can therefore be seen that, even if different countries have different understandings of, and concerns in term of, emissions reduction, the necessity for cuts and the universal concern for the protection of the climate have been brought onto the agenda of many different countries.

Co-opetition combines all these factors together, so that energy security is not only a form of NTS, but it is also not isolated from, or unrelated to, other aspects of national security. The military, the economy and the environment are all inextricably linked to energy security, and these different security types cross over and intermingle.

2.1.4 Interdependence and Co-opetition

Interdependence as the common trait in economy and energy determines the existence of co-opetition. In other words, the nature of interdependence will lead to inevitable and long-lasting competition between states, and as such, with the increase in interdependence in the globalised political economy will come greater and more intense competition. As competition is accepted as a pre-existing and inevitable condition, any analysis of co-opetition must focus on the feasibility of cooperation instead. In other words, competition undoubtedly exists within international relations, but the prevalence of cooperation is somewhat questionable.

In traditional terms, security at an international level has entailed reinforcing a strong military in order to defend against invasion. (Tiklare and Thomas, 1991) As Baldwin (1997) notes, security involves flying the military flag. In the legacy of strategists the world over, including Clausewitz and Sun Tzu, classic strategy has always been focused on war. Gray (1999a:17) sees

strategists as concerned with ‘the use that is made of force and the threat of force for the end of policy.’ This kind of war-based strategy is founded upon the belief that competition leading to victory can secure significant benefits for a country.

Waltz (2010) argues that the need for self-help incites countries into following more powerful countries, and that the world system is determined by the number of powerful countries. With changes in distribution of power, the balance will break down. However, resources will be re-allocated and balance of power once more reached. In the opinion of both Waltz and Morgenthau, anarchy refers to there being no common or highest authority in world politics, with every country consequently using any action to protect their own interest. (Sheehan, 1995) Within this thinking, states in the world system are independent and only the strength of their own power can assist them in obtaining their interests.

Realists traditionally see conflict as inevitable under anarchy. War is brought about not only because each side pursues its own security measures, but because ultimately at least one side, if not all parties, are pushed to take the offensive. However, as Mueller (1993) states, democratic peace is one of the most important challenges to realism. Under the democratic peace which has flourished since the Second World War, the chance of an outbreak of war between democratic countries has become minimal, allowing for the emergence of policies of cooperation to tackle problems and protect interests.

However, Gilpin (1981) conjectures that interdependence actually refers to unequal attachment relations; economic interdependence establishes unequal power relations within the group, producing a state of vulnerability for some, and power and ease of manipulation for others. Many countries attempt to strengthen their own independence, and increase the dependence of other countries. From this angle, interdependence is not a source of peace, but a reason for conflict.

Nevertheless, as Lindsay and Daalder (2003) stress, with the increase in trends of deep interdependence, countries are becoming much more inseparable. As a result, potential common interests and values increase. In order to protect these common interests, policymakers must respond to demands arising from the state level to the global level. Keohane and Nye (2011) point out that traditional concepts such as balance of power, focused on national security, cannot define all the new modern threats faced by countries worldwide. In short, the old international pattern is diminishing, and the world is becoming ever more interdependent. Although the world system is still characterised by anarchy, there is also a strong trend of interdependence. The two concepts are not mutually exclusive.

Energy is trans-boundary in nature. In other words, it is located all around the world, and must be transported between nations and across borders. Transport is thus one of the most important aspects of energy security. As energy consumption and transportation are trans-boundary, there is a

strong argument that production should become a trans-boundary issue too. Countries can cooperate in order to achieve complementary and integrated operations. In other words, co-opetition can exist within this framework of conflicting and common interest, wherein both cooperation and competition inevitably occur.

Realism and liberalism take differing positions on the prospects for cooperation. In general, realists argue that it is difficult or even impossible to achieve true cooperation under anarchy. Waltz (2010) describes anarchy as the basic order of international society as it lacks a central government or authority. Under the condition of anarchy, realists believe cooperation is nigh on impossible to achieve. Firstly, states are rational actors and will always choose what is best for their own individual state interests. Secondly, the nature of conflict is never changed in the group over time (Gilpin, 1984), because in anarchy, states are self-regarding, not other-regarding. (Mercer, 1995) Without central authority, states need to self-help in order to survive. Liberalism, on the other hand, proposes that cooperation can be achieved under the new world order, because increasing interdependence pushes not only states, but also other transactional actors, to cooperate with each other in order to reduce conflict. (Axelrod and Keohane, 1985; Keohane and Nye, 2011)

Waltz, a realist scholar, presents a slightly different argument, claiming that although the world is anarchic, the key target for states is

obtaining security, not power. Conflict is inevitable for states in order to strengthen security, but states may choose the path of negotiation rather than war, because cooperation is a way to avoid the high cost of conflict. (Waltz, 2010) From this perspective, cooperation can be achieved in order to secure state interests, but how exactly this may be done, as well as the position of international organisations in the equation, are yet to be fully considered.

This research does not stake a claim as to which of these schools is correct, if either, but does argue that both approaches have limitations which can be revised. It is argued herein that competition will not disappear, but that cooperation can be coordinated, particularly under commitments by international organisations, which represent a platform of state interdependence. In order to cope with this, four assumptions are proposed.

First of all, International Organisations (IOs) play an important role due to the interdependence in co-opetition, but still cannot replace the function of states. In other words, IOs do not necessarily share the same functions as states, but they are also not to be overlooked in IR. As Held (1991) explains, international organisations can help states achieve security targets. That means the major actors in the international system are still states, which are easily influenced by international conditions. States face modern challenges from an array of factors, including, for instance, the economy, culture, domestic nationalism and energy. With greater interdependence, the effectiveness of certain political means of states is reduced, but

simultaneously, international organisations and NGOs may be able to offer solutions and platforms to cope with these challenges. (Ferguson et al., 2000)

Mann (1997) argues that the existence and proliferation of transnational actors is not a sign of the decline of the status of states in world politics, because although states are no longer the only ones to shape international norms, their central authority remains significant because it guides and enforces principles within the state's authority. International organisations in their current structure cannot replace this role. It is also argued that international organisations are important because states are unable to fully pursue their interests in the face of an anarchic structure lacking a central authority. (Oye, 1986b) International organisations can supply a platform to formally link interests and states together. Neoliberals believe that global regimes can weaken the negative influence of anarchy, and refute the pessimism of realism regarding the prospects for cooperation under greater interdependence. Neoliberalist thought stresses the importance of interdependence and institutions, placing hope in internationalism and international regimes, but it is conversely criticised that neoliberalism exaggerates the importance of economics in security. However, Milner (1991) states that interdependence under anarchy can help states to learn others' true preferences and thus make informed choices to secure their own interests. This point of view posits that the result of interdependence is not necessarily absolute harmony, but instead further competition under a veil of cooperation.

Secondly, interdependence in co-opetition is not only military but also economical. As Keohane and Nye (2011) illustrate, the concept of complex interdependence considers interdependence to stem from economic cooperation, and claims that the importance of economic concerns has overtaken the traditional importance of the military. However, this research argues that the deepening of interdependence is not only due to greater economic integration, but also to other aspects, such as energy. What's more, although it can be argued that the increased occurrence of cooperation means that the role of the military is less significant than previously, there is still no doubt that the military is an important factor, even within efforts towards cooperation itself. In Section 2.1.3, energy security was considered as a type of NTS, and it was concluded that energy is a factor within national security as a whole, interacting with and influenced by the military, the economy and the environment. None of these separate dimensions can be isolated and considered more or less important than others, as each interact and play different roles in the bigger picture of national security. The importance of economics is undeniable, but nevertheless must not be overstated; nor must the continuing role of the military be overlooked. For instance, in these interlinked dimensions, the military is often the sole tool able to maintain energy security in terms of clashes over sovereignty or transportation risks. Economic cooperation and international organisations are as yet not in a

position to fulfil the role of the military in supervising energy transportation or safeguarding sovereign resources.

Thirdly, building trust in co-opetition has become much more difficult due to the existence of interdependence. International regime may be a breakthrough point which can neutralise disputes caused by a lack of trust in cooperation. Realist literature frequently discusses the constant risk of the 'security dilemma'[11] in cooperative efforts between states. Falling into the security dilemma trap often forestalls any trust, and therefore any possibility of true cooperation. As Waltz (1979); Waltz (2010) describes, one state may take a series of actions to safeguard their own security, which in turn reduces the security of other states that are forced to formulate responsive measures. Buzan (1983) corroborates, stating that when one country seeks safety and rights, it is easy for threats to others to occur. In addition, Nye (2004) points out that the security dilemma will cause every individual to perform some action to increase their sense of security, which will lead to involvement in a competitive vicious cycle of security. Gray (1999b) argues that arms races, for example, reflect the differing interests of actors within a conflict. War is brought about not only because each side pursues its own security measures, but because

[11]The concept of the security dilemma was proposed by John Herz in 1950. He believed that anarchy creates conditions of indeterminacy about the exact intentions of individual nations, causing nations to fear inroads by others. Actors thus pursue more power in order to keep themselves safe. However, these actions lead to others feeling increased insecurity, and cause them to pursue more power too. This cycle increases insecurity for all actors in the system (Herz,1950) The security dilemma has long been shown through the 'prisoner dilemma' in game theory. Section 2.3 will cover this in more depth.

ultimately at least one side, if not all parties, are pushed to take the offensive. In addition, as Wendt (1999) explains, the limitation of this security dilemma is that it completely rules out peaceful international competition and true international cooperation amongst countries. States are obliged to compete in many ways, but this often prohibits cooperation, which may also be beneficial. That is why, for realists, the chances for successful cooperation under international anarchy are very low; states' preferences tend to be for reducing cooperation and employing self-help to achieve self-sufficiency.

In addition to the security dilemma, asymmetric power also hampers the establishment of trust among states. (Sutter, 1995) Asymmetric power under an anarchical structure may limit cooperation between countries. States fear that with unlimited cooperation, dependence may grow to the point that a state loses its own power of decision, and falls under the control of another actor. (Li, 2009) That said it is not impossible that entering into cooperation could bring extra strength and benefits. However, realism assumes this to be an unlikely scenario. (Womack, 2004)

Furthermore, the over-interdependence between states also makes trust difficult. In the event that cooperation does occur, states may be concerned about their growing attachment to other countries and the development of a closely tied commodity and service exchange. In other words, close interdependence may entail a certain vulnerability to influence by other states. (Keohane and Nye, 2011) This concern may well hinder attempts

at cooperation. As a result, realists such as Waltz (2010) argue that countries should reduce dependence and achieve conditions of self-help, believing that institutionalism does little to affect the security dilemma.

This research opposes this realist school of thought by pointing out that, in reality, the game of cooperation between states is not discrete and will not take place only once. It can be repeated ad infinitum. Repeated results in the long-term may turn out differently, in particular due to the existence of revenge. It is interesting to find that, despite its generally pessimistic outlook on cooperation, even realism tends to neglect the possibility of revenge. As Oye (1986a) mentions, three further factors can influence cooperation, namely: revenge structure[12], the shadow of the future and the number of actors.[13] Regarding revenge in particular, Oye (1986a) believes that it may not fit rational behaviour models such as the prisoner dilemma, because current choices may be influenced by past occurrences. Ignoring revenge may cause errors in judgement from both realists and liberalists. In other words, repeat games may conjure up different scenarios, such as cooperation due to long-term interest, or revenge due to previous betrayal. (Hoekman and Kostecki, 1995) Since countries are engaging in strategies of reciprocity and 'tit-for-tat,' after repeat interactions in which common interests are damaged, states will eventually come to find that cooperation represents the best long-term strategy.

[12]The concept of revenge structure will be analysed in greater detail in Section 2.2.2.

[13]A discussion on the numbers of actors in game theory will be presented in Section 2.2.2.

However, due to restrictions on information communication and continued doubts, betrayal is still a distinct possibility. (Axelrod and Keohane, 1985) Grieco (1988) mentions that the key limitation of cooperation is the possibility of cheating, and suggests that this can be overcome by increased institutionalism. The existence of effective institutions alters the possibility for cheating and, crucially, improves the limited information communication, which is a major aspect of the classic prisoner dilemma. Increased institutionalism can thus benefit cooperation by supplying information, reducing costs and placating the worries and doubts of participating partners. A responsible and trustworthy international regime can mitigate states' instinct to maximise their interests. (Fearon, 1998) This point of view is, of course, debated fiercely within academia, in large part because there are many issues concerning the practical implementation of such a regime.

Besides this, Axelrod and Keohane (1985) argue that it is the responsibility of states to alter their behaviour and place a high cost on defecting, as well as enabling the monitoring of concrete actions, in order to make headway in global cooperation. In order to increase cooperation, Fearon (1998) suggests that international cooperation should be characterised by two sequential phases – the bargaining phase and the enforcement phase – which suggests that monitoring and enforcement can influence successful cooperation. In short, although liberals accept the assumption of anarchy, they consider cooperation to be a distinct possibility when real trust can be

established between states, believing that this trust can be forged and monitored by the global regime as necessary. Liberals therefore advocate the foundation of global regimes to build a bridge to encourage cooperation.

Fourthly, it is argued in literature that the existence of interdependence will cause difficulties in dividing up common interests. As explained by Grieco (1988), realism deems anarchy the fundamental trait of global relations, leading states to suffer from constant insecurity and preoccupation with the distribution of interests. Another key argument between realism and liberalism is that of relative gains versus absolute gains, which is an oft-mentioned issue in terms of the prospects for cooperation. However, relative and absolute gains should not become obstacles in efforts to develop institutionalism. Neoliberalism, for example, does not overlook the attraction of relative gain, but instead strives for absolute gain where possible as this boosts the prospects for institutionalism by allowing rival parties to both benefit. (Jervis, 1999) Keohane (2005) takes into account rational choice, claiming that states are rational actors, and aim to obtain the most interests with the least cost. States care about their own interests, and do not care about the interests of others.

However, realists hold that states pay scant attention to participation and positive-sum outcomes, but instead pay attention to which state is in a position to benefit more. Thus, the interests of other states are important in terms of relative gain. As Grieco (1988) mentions, states will cheat if

necessary during cooperation in order to guarantee that their partners do not gain more than they do in relative terms. This is due to the principle that a partner today may become the enemy tomorrow. Relative gain may translate into relative power, and this may change the states' behaviour and the overall balance of power. Waltz (2010) also argues that relative gain is an important issue for states; in other words, states will be unsatisfied with absolute gains if other states are also gaining benefits – it is crucial to secure a relatively higher gain than competitors in order to keep ahead and avoid risk. States will therefore pay close attention to partners' benefits, significantly damaging the prospects for cooperation.

For the sake of cooperation, it would be crucial for states to make an effort to shift their focus from relative gains and the power asymmetry of the sides engaged in cooperation, in order to gain benefits. However, as Krasner (1991) states, strong powers can dictate who may participate in the game, and who may be able to change the rules of the game, or even the results, at whim. As such, the distribution of power plays a key role in the success of international cooperation. According to Keohane et al. (1989), the distribution of wealth and power create conditions of extreme asymmetry, and as such, it is difficult for some parties to obtain the same interests without paying different costs relative to their power. In fact, strong states may force smaller or weaker states to make policy adjustments to suit their own interests. (Gruber, 2000) A strong international regime may go some way to reducing this issue,

particularly benefiting small and weak states.

These two classic schools of international relations theory analyse the chances for cooperation very differently. Whilst both sides recognise that there is great potential for states to cheat or defect during cooperation, liberalism sees this as a challenge to be overcome by global regimes. Realism, however, considers that the unchanging state of anarchy and the lack of a central authority mean that cooperation will consistently suffer. Current literature debates the constraints of global regimes and the discussion over responsibility, but also must take into consideration the specifics of countries' internal situations, which are unequal and may limit development opportunities.

In sum, the nature of co-opetition surrounding energy is replete with the integration of world resources and shaped by the economy, military and environment. Energy security from the perspective of co-opetition therefore goes over and above NTS. In addition, economic integration is not the only form of interdependence; interdependence is also growing in other dimensions, including energy. Furthermore, international organisations have not surpassed states in terms of importance, but maintain their own specific role and can assist states in reducing conflict and obtaining greater interests, in addition to helping redress the balance of power asymmetry in cooperative efforts.

2.2 Co-opetition within Game Theory

Research into game theory and the strategy of decision-making has its origins in the book *Theory of Games and Economic Behavior* by von Neumann and Morgenstern (2007), first published in 1944. This book outlines how game theory can use mathematical methods to analyse the optimal strategies of players with conflicting interests when engaging in competitive activity. Game theory therefore provides a model for balanced decision-making, as well as possible setbacks, when two or more individual rational actors directly interact. Game theory has been defined as an interactive decision theory. (Durlauf and Blume, 2008)

Game theory was initially employed to analyse conflicts. For example, Schelling (1980) uses game theory to explain conflicts in international relations, expounding upon the function of deterrence in state interaction, with a particular focus on how to use the military as a credible deterrent. Schelling (1980:21) had previously compared conflict within international relations to 'when two trucks loaded with dynamite meet on a road wide enough for one.' Nonetheless, he does not deny the possibility of rational cooperation, recognising that international politics need not be a *zero-sum* game, as many international rivals in fact share some common interests, which may be used as a bargaining chip should the parties be prevailed upon to coordinate their strategic cooperation. Brams and Bramj (1985) also used game theory to analyse conflicts between global

superpowers. Whilst such conflicts may appear to be impulsive, game theory reveals that they are generally based upon rational decisions working for states' own interests. Scholars working with game theory may be able to provide suggestions for national strategy in terms of both conflict and cooperation, although liberal and realist viewpoints may differ on the most appropriate analysis of circumstances. Both realism and liberalism are based on rationalism and rational choice. (Wendt, 1999) Besides this, states are characterised as a unified actor engaging in rational behaviour, working for the maximisation of self-interest within the existing structure and system. (Waltz, 1979; Keohane, 2005; Waltz, 2010)

Thus, this study also employs game theory as a method for analysing co-opetitive strategy, which involves competition, the traditional focus of game theory. Only through interactively understanding each other's policies, can states' own strategies be adjusted to match the future direction of development. Sun Tzu's *Art of War* advises that 'If you know the enemy and know yourself, you need not fear the result of a hundred battles. If you know yourself but not the enemy, for every victory gained you will also suffer a defeat. If you know neither the enemy nor yourself, you will succumb in every battle.' (Sun Tzu, 2009:18)

As Fan (2011) mentions, there are five key aspects to take into consideration within game theory. The first aspect is the player. In some literature, such as Binmore et al. (1993), players are also called gamesters,

and game theory is occasionally referred to as gamester theory. Players are the actors that make decisions and decide how to play the game in order to obtain the largest interest. Furthermore, the player can be two individuals or groups. Importantly, the players make their decisions based on rationality. The second aspect is information. Information refers to the knowledge of the players in the game, garnered through understanding and observation. Information is of utmost importance to the participants, and so they must observe the behaviour of the other players in order to obtain the information necessary for them to make the most optimal strategy. The third aspect is tactics, which refers to the set of actions that players choose to respond to the actions of other players in the game, and dictates the timing of these actions in order to obtain the greatest benefit. However, as Armstrong and Clark (1997) affirms, it is difficult to predict the specific tactics in co-opetition. This indicates that in the following cases of tactics, it is difficult to recognise a specific strategy deployed by one state on another. The fourth aspect is known as payoff, which refers to the utility received by players under a certain series of tactics. The final aspect is equilibrium, which represents the best strategy for all players. The following sections take these aspects into account in the discussion of co-opetition, and employ them in the creation of a game theory model to apply to cases of co-opetition.

Doubts are often raised as to whether mathematical models can be applied to analysis in the field of IR or political science. Game theory, despite

representing a branch of mathematics, has been widely used in economics and other disciplines including IR. (Barron, 2007) In fact, game theory is first and foremost a logical theory. As Wang (2011) explains, the goal of game theory is to find optimal solutions, rather than simple mathematical solutions. In this paper, game theory is used as a tool to analyse the problem at hand, to simplify the problem and analyse the outcome of co-opetitive decisions and strategies with more clarity and precision. In other words, this study is not heavily mathematical in its analysis.

2.2.1 Conditions of Co-opetition within Game Theory

Game theory is always a good measurement of co-opetition. There are three major pre-conditions for co-opetition in game theory. First of all, perhaps the most crucial pre-condition for co-opetition is the presence of both common and conflicting interests. Bengtsson and Kock (2000) explain that the relationships present in co-opetition may be rather complex as they involve two different types of interaction. They go on to elaborate that co-opetitive partners have to be simultaneously friendly (due to common interests) and hostile (due to conflicting interests). Within co-opetition, common interests between rivals generally represent the shared desire to make the pie bigger, whereas conflicting interests arise as a result of differing judgements regarding division of the pie. Common and conflicting interests are a pre-condition for the

existence of a relationship of co-opetition. In terms of international relations, therefore, states hoping to engage in co-opetitive relations should not only be aware of competing interests, but must also identify potential common interests or mutual objectives.

The key issue of energy security identified by this research is that supply cannot meet increasing demand. States are thus forced to attempt to reduce domestic usage whilst simultaneously increasing imports from elsewhere. This research recognises that energy can be deemed either public goods, or private goods. The discussion of public goods started in 16th century Britain. Two requirements decide what can be deemed a public good. The first is that the good in question can be enjoyed by everyone, and the second one is that it has a certain lifespan of usage.

The Nash equilibrium of Dutta's public goods model is C1*=C2*=$\frac{y}{3}$, wherein C1 refers to the resources that player 1 can use, C2 refers to the resources that player 2 can use, and *y* stands for the total amount of public goods. As Dutta (1999) explains, in the first period, player 1 can share $\frac{y}{3}$ and player 2 also can share $\frac{y}{3}$. The remainder of $\frac{y}{3}$ is left over for the following period, meaning that player 1 can share $\frac{y}{6}$, as can player 2. In the energy game, if there are only two players, the best strategy for players to take regarding a disputed area of energy reserves would be joint exploration, where each player can obtain $\frac{1}{3}$ of the total amount. Dutta also proposes another game with more than two players, and concludes that C1=C2=…=C*N*=$\frac{Y}{2N}$. An

increase in *N* reduces what is left for everyone to share. In other words, in new energy exploration, reducing the players leads to greater gains.

This analysis is from the perspective of energy as a public good, wherein reducing the number of players increases the available interests for participating players. If public goods are considered from the angle of costs needing to be borne by players, any initiative by one state can bring about benefit for others. However, this requires the state launching this initiative to bear any costs unilaterally and this is an unlikely choice for a state to make. (Olson and Zeckhauser, 1966) In terms of energy, domestic tactics to prevent a state from having to make this first move could include controlling levels of demand and building strategic fuel reserves. However, controlling demand has knock-on effects on economic development, which domestic consumers will have to face, and some methods of control, such as imposition of fuel duties, directly affect the consumer. The following Table 2 can be drawn for energy as a public good:

Table 2: Payoff Matrices for Energy as a Public Good (*2b>c>b*, * Nash equilibrium)

	B (Action)	B (Inaction)
A (Action)	(*2b-c, 2b-c*)	(*b-c, b*)
A (Inaction)	(*b, b-c*)	(*0,0*)*

(1) If Player A chooses, for example, to impose a fuel tax, then they will reduce import levels from outside and must pay *c* for the cost of this

change. A has taken the initiative and is faced with cost *c*, but also reaps the relative gain represented by benefit *b*, as does player B who has taken no action of their own. Therefore player B is free riding.

(2) If both Player A and B impose domestic fuel tax and thus reduce imports, this will have a double effect on their relative gains, represented by figure *2b*. However, both took action and thus both must pay cost *c*.

(3) If neither player A nor B take any domestic action, both have no choice but to accept the levels and rates of import from a producer. Neither contribute towards public goods and neither gain benefit.

Thus it can be seen that due to high levels of interdependence in terms of energy, consumers can benefit from taking action themselves or from the action of others. In the similar case of building strategic reserves, for example, if A takes the initiative to build up a reserve, it will obtain result *b*-*c*, whereas player B will be able to take gain *b* whilst sitting idle. Thus, players choosing to take action must decide whether the action is valuable enough to merit rewarding other players with the fruits of their own labour. In the case of overt information transfer, the least costly choice for both players is inaction. However, this choice will not make any contribution to relieving issues of energy security.

However, if energy is considered to be a private good, the situation will be different. Take offshore resource exploration as an example. In this

case, other states cannot benefit from the action of others, and thus both will choose action in order to make gains, as shown in the model below.

Table 3: Payoff Matrices for Energy as a Private Good (*2C>b>C>0*, * Nash equilibrium)

	B (Action)	B (Inaction)
A (Action)	(*b-2c, b-2c*)*	(*b-c, -c*)
A (Inaction)	(*-c, b-c*)	(*0,0*)

(1)If both A and B choose to take action, they will both gain benefit *b*, but must pay double the cost, represented by the figure *2c.* Both obtain b-*2C*.

(2)If any one player takes action, but the other does not, the positive player will gain the outcome of *b-c*, and the inactive one will bear the cost of *-c* with no benefit.

(3)If neither takes action, they will obtain nothing.

In sum, co-opetition within international relations, and specifically in terms of energy security, is decided largely by the conditions under which it functions. If energy is seen as a public good, this has a different outcome than when it is seen as a private good.

A second condition for co-opetition is complementarity, which can take many forms, such as complementary knowledge, technologies, skills or contacts. Players in a game of co-opetition benefit from possessing different but complementary resources. Brandenburger and Nalebuff (1998) conclude that co-opetition which best results in the enlarging of markets occurs between

complementors. Lewis (1992) is also convinced that complementary attributes and needs are one of the most important factors dictating the success of co-opetition. In addition, Akdoğan and Cingšz (2012) claim that a trusting environment can be built more easily if rivals enjoy complementary resources. Luo (2004) remarks that co-opetitive partners with different resources can obtain more benefits by complementing their own resources with those of their counterpart. Thus, in terms of international relations, states or regions wishing to enter a co-opetitive relationship would do well to possess different but complementary resources. Furthermore, complementarity determines added value in co-opetition, which will be discussed in greater depth subsequently.

Another clear requirement for co-opetition is the establishment of trust. In the context of co-opetition, trust can be seen as the most essential factor in a relationship between rivals. (Akdoğan and Cingšz, 2012) Devetag (2008) believes that trust within co-opetition is mainly related to an actor's expectations of their counterpart's compliance with agreements. Perry et al. (2004:952) offer a corroborating viewpoint: 'trust is positively related to commitment in horizontal alliances' and 'the relationship between technological uncertainty and commitment is less negative when trust is high than when trust is low.' Therefore, in order for successful co-opetitive relationships to be forged within international relations, a pre-condition of trust between states or rivals is absolutely crucial. It is also argued that the establishment of energy regimes can coordinate the relations among members

and achieve trust. Regimes can be defined as ‘sets of implicit or explicit principles, norms, rules, and decision-making procedures around which actors’ expectations converge in a given area of international relations.’ (Krasner, 1982: 186)

In the international system, interdependence decides the existence of common interests. However, Keohane (2005) argues that the existence of common interests does not mean that cooperation will necessarily occur, but only that it is a possible outcome. Whether cooperation ultimately does occur depends on the involvement and effectiveness of global regimes. Waltz (2000), on the other hand, believes that the survival of states relies on their own power, but that international regimes can also provide a degree of benefit. Despite the emphasis on the power of the state, the establishment of international regimes is not opposed; rather, international regimes are seen as simply a tool allowing the state to obtain more interest in the international system. (Xu, 2008)

Under the conditions of international anarchy, states face the dilemma of whether to participate in international regimes and thus allow the regimes to subsequently supervise the actions of the state. One approach to this is the bargaining model, where rational states calculate the cost, gains and external threats of their decision. (Fudenberg and Tirole, 1991) A second approach is that states are persuaded by the principles of the regime itself and deem it a natural choice to participate in the regime. (Risse et al., 1999) There is no obvious contradiction within these two different approaches; in fact, they

are complementary, because states can choose to participate to different degrees in different regimes in different time periods, depending on their analysis of the cost and benefit of doing so. (Checkel and Advanced Research on the Europeanisation of the Nation-State, 1999) Two rules of the game theory model, namely reciprocity and commitment, require the supervision of international regimes.

2.2.2 Co-opetition within a Model of Game Theory

This research will centre around a model of co-opetition based on the game theory approach. In terms of literature on competition and cooperation, it is difficult to steer clear of game theory. Werhane et al. (1997) explain that game theory is system-level research，which relies on calculating outcomes through analysis of rational choice in situations of interdependence. In other words, when personal choice depends on the choice of others, human behaviour can be explained, predicted and evaluated through this approach. Under the established reality of interdependence, any individual choice is relative and individuals must consider a range of alternative possibilities before making their choice. Game theory purports to tell us why these choices are made and how the greatest interest can be gained through understanding of these choices.

As explained in Chapter One, the fundamental problem of energy security is that increasing world energy demand cannot meet supply. This has resulted in a series of problems, such as intense competition in the energy market, including over imports and new exploration of offshore resources; difficulties in coordinating the relations between, and behaviour of, consumers and producers in the global energy regime; and controlling and limiting domestic usage. The function of co-opetition in the global energy regime would be to attempt the resolution and relief of these tense issues. This research makes use of game theory to analyse the fundamental problems and generate effective and appropriate national strategies, reducing risk and loss as far as possible whilst simultaneously reinforcing security and increasing income. In other words, building a model of co-opetition may prove to be a helpful way in which to analyse and develop energy-related strategy. This strategy is based on a theoretical model; it should therefore not only obey fixed and existing assumptions, but also take into account the fact that employing a theoretical strategy in practice may involve unforeseen variables.

Brandenburger and Nalebuff (1998) outline five important factors which can decide co-opetition, namely players, added value, roles, tactics, and scope (PARTS). This research connected these five elements and game theory's five key aspects together in order to analyse co-opetition within game theory and to demonstrate another five assumptions of successful co-opetition such as two states with power asymmetry, a high degree of complementarity,

step-by-step reciprocity and commitment, and monitoring by international regimes.

Players

It is difficult to assert exactly how many players are needed to achieve stable cooperation within a game, because cooperation can be achieved within both infinite and finite conditions. This research identifies an optimum of two players due to two reasons. Firstly, in terms of numbers, the more participants engaged in a game, the greater the cost and likelihood of failure. For example, each player will strive for more interest and decreased responsibility. Waltz (2010) mentions the existence of the free rider, who gains benefit without sufficient input. With fewer participating units, or actors, the likelihood of free riding decreases, and the system will be more stable. By this logic, two should be the most stable cooperative partnership. Further to this, more actors means more chance for betrayal. Oye (1986b) notes that with more players in the game, the opportunity for successful cooperation decreases, because each member must identify and recognise opportunities for the advancement of mutual interest. Once interests are identified, actors must alter their behaviour in order to adjust and coordinate, increasing their costs of participation. Milner (1992) cites Keohane's analysis of reciprocity, which posits that there are three key aspects: recognition of a defector, revenge upon the defector, and justification for the revenge. However, with more players, it is difficult to fulfil

each of these aspects and create true reciprocity, meaning it is difficult to sanction any defectors, or even identify their defection.

Furthermore, there is another important precondition of the game: players are considered to be rational actors, and their performance is fixed. The behaviour of actors will not change easily and serves to rationally obtain the greatest interests. However, changes in environment and information brought about by an increased number of actors are likely to lead to more unpredictable and changeable behaviour from the participating actors. (Morrow, 1994) As a result, finite is better than infinite in the game.

The second reason is based on differences in power. Players in a game may be symmetrical or asymmetrical. Firstly, a game involving asymmetrical powers is known as the Dictator Game (DG). According to Güth and Huck (2002), two basic conditions must be met to create the DG scenario: firstly, the sponsor A has an absolute decision-making power over the allocation of the cake; secondly, even if respondents B is unwilling to accept this assignment, it will not affect the specific implementation of the programme. That is to say, if A proposes to allocate the cake to *x,* then B will receive 1-*x*, and B does not have the right to vote or influence this matter.

However, the key issue which needs to be dealt with in DG is how to appease the respondents, and pacify B's emotions regarding this unfair game. If left with negative perceptions of the game, a substantial proportion of respondents would be willing to reject future offers, even positive ones.

(Kahneman et al., 1986) In fact, maximising profit does not always reach Pareto optimality due to the pressure of reputation and long-term stable development. This rationality can significantly influence the choices and actions of less powerful respondents. In other words, the understanding on relative gains and absolute gains by the player will influence the game.

It has been stated that two players is the optimum choice for the game of co-opetition; these two actors should not be chosen at random. Instead, the added value of each player should be taken into account. In other words, what power do these two players have? Potential cooperation may occur between states at equal levels, or between those with large asymmetry. For example, if state P is at level *xP*, and another state, Q, is at *xQ (Q>P+1*), the two states are relatively evenly matched and as such, relative gains take on greater importance. However, if for example state Q is at (*Q>P+5*), the large asymmetry between the states means that Q is able to consider merely absolute gain. This can be shown in the tables 4 below. If it is assumed that the balance between the states is (*Q>P+1*):

Table 4: Payoff Matrices for Asymmetrical Players

	Q C(Cooperation)	Q D (Defector)
P C (Cooperation)	(4,5)	(1,6)
P D (Defector)	(5,1)	(2,2)

(1) Should both players chose cooperation, Q is able to obtain more interest than P due to its relative power. That is to say, the relative gain that Q

can give P is +1. However, due to the balance *q>p+1,* any interest that Q can obtain will not influence P's interest.

(2) If any player chooses to defect, that player will gain greater interest than if it cooperates. For example, if the strategy of Q is to defect, whereas P opts to cooperate, then the relative outcome for P is -5. Over a long time frame, this could greatly influence the interests of P. However, both states are able to adjust their strategy over long, repeated games and it is not always clear which state, if any, will choose to defect.

(3) If both states choose to defect, although the absolute gain for both is 2, the relative gain for both is 0. This does not influence their relative interests.

In conclusion, in the scenario that (Q>P+1), Q's potential relative gains are not influenced, whereas those of P may be depending on the actions taken. No matter what action P takes, Q will seek the largest absolute gain, rather than consider relative gain. That is to say, in this kind of game, the chances for cooperation are higher than other scenarios, as one player is in a position to overlook relative gains.

If it is assumed that Q=P or Q=P+1, then it is as shown in Table 5:

Table 5: Payoff Matrices for Symmetrical Players

	Q C (Cooperation)	Q D (Defect)
P C (Cooperation)	(4,4)	(1,5)
P D (Defector)	(5,1)	(2,2)

(1)If both Q and P opt for cooperation, both achieve absolute gains of 4 as the interest. As Q=P, development may be of negative influence on P.

(2) If either Q or P choose to defect, the other player can only gain 1. In other words, the defector obtains a far greater interest.

(3) If both defect, the absolute gain is 2 and the relative gain is 0.

Consequently, P, as a strong country compared with Q, will opt for defection over cooperation and this will cause the failure of the cooperation. As a result, if these two countries are asymmetrical in terms of power, the stronger country will be in the leading position and the weak country will have to comply with the strong one, as the cost of defection is significantly higher. This is likely to lead to increased cooperation due to the cost of defecting. (Wu, 2007) As such, a situation of co-opetition may come about between two strong countries in coordination, both able to simultaneously cooperate and compete, whereas between a strong and a weak country, it is difficult to maintain a significant level of competition.

Secondly, if the two players possess the same resources, or they have the same requirements, this dictates the concrete operation of the game. The players become oligarchs and the game transfers to the oligopoly game type. Price and production need to stay relatively stable; small adjustments must be made to production based on needs, if possible, in order to keep prices stable. (Meister, 1999) The *Cartel Model* is an appropriate example to demonstrate this kind of relationship. Within the Cartel Model, it is acknowledged that the goal of a cartel is to enlarge the entire interest, including that of all the players. OPEC is generally used as the most obvious

example of a cartel, which is used to analyse whether the members can make, and comply with, their own commitments on oil production quotas.

Two players from within OPEC – Venezuela and Saudi Arabia – can be considered as an example. According to Dutta (1999), assuming the production of Venezuela is VA while that of Saudi Arabia is SA, the discount rate is δ, and high demand is *p*. He draws the conclusion that $\delta \geq \frac{1}{1+2p}$. SA will not break commitment on quotas if p>1. However, if p<1, it would be difficult for betrayal on quotas to be prevented within OPEC. In fact, after the 1990s, consumer countries turned more and more to the development of new alternative energy in order to reduce the high dependence on oil and, in addition, new oil exploration commenced in non-OPEC countries. As a result, *p* has tended to be smaller than 1, which means that SA has the motivation to increase production to obtain more interest. In terms of VA's discount rate, if $\delta \geq \frac{19}{19+2p}$, VA will not break commitment on quotas, and the result is that the smaller *p* is, the higher the likelihood of betrayal on the commitment. This shows that in energy cooperation, targeting a smaller producer may be easier for consumer countries than selecting a more powerful, strong one. In other words, due to the relative flexibility of weak countries on oil quotas, cooperative opportunities may be advanced and more imports secured.

However, this begs the question as to whether joining a cartel is of real benefit to individual producers, and also whether cartels can exist for long periods of time. The example of OPEC suggests that there are two reasons

why cartels continue to exist successfully; these are regional concentration and shared high production quality. Imbalanced energy allocation decides the possibilities of regional concentration, and high quality dictates whether customers will choose to continue cooperation. The IEA considers the four factors of energy security, economic development, environmental awareness and engagement worldwide to investigate whether these cartels can be more resilient than regional organisations with regard to energy security. (IEA, 2012)

If there are two players in the game and they have symmetrical power, cooperation cannot continue if both take a 'tough' attitude rather than capitulate. In the case that the power of the two players is symmetrical, Dutta (1999:130) proposes the 'Chicken Game': d>b>0>a, and *P* is the odds that player 2 will choose the tough approach. He summarised that $P=\frac{d-b}{d-b-a}$, and that each player has $P=\frac{d-b}{d-b-a}$. In other words, in a symmetrical game, all the players have to choose the same strategies, make the same decisions, and earn the same profit. That is to say, with both players choosing the tough approach, cooperation will not take place and conflict may erupt.

Table 6: Payoff Matrices of the Chicken Game (Dutta, 1999)

	Tough	Capitulate
Tough	*(a, a)*	*(d,* 0)
Capitulate	(0, *d)*	*(b, b)*

However, Schelling proposes a different result: one player will offload a wheel and shout I cannot turn to the other player. The other player will turn when he receives this information. (Dodge, 2012) That is to say, one player will cheat

the other. The way in which cheating influences the outcome of the energy game will be analysed in the case study.

Why, then, are two asymmetrical players better than finite players in the game? Considering the example of the three alternatives for Russian Far East oil, firstly, Russia could have built an oil transfer pipeline from Angarsk to Daqing (China), or Angarsk to Nakhodka (facing Japan's eastern coast). The final choice – chosen by Russia – was Tayshet to Nakhodka. This third plan involved the most expensive and lengthy construction, so why was this the favoured choice? Although China, Japan and Russia display marked interdependence, the power balance is asymmetrical, due to the fact that they obtain different resources in the game. According to Keohane and Nye (1989), smaller states will often depend on each other as a secondary power resource.

Russia is a producer state, leaving the consumers China and Japan to compete. In this case, Russia is in a leading position and Japan and China must ultimately accept the decisions of Russia. Russia was not willing to lose potential considerable and stable market demand in China, but neither could it fail to supply Japan. Therefore, a pipeline was built from Tayshet (Russia) to Nakhodka (Russian coast), adding a 64km branch to Mohe (China). As Labeckaya (2003) explains, Russia first considered its own interests before making a decision. By choosing this pipeline, it is now in a position to supply oil to China, Japan, Korea and even further afield to Pacific nations and even the USA. Building a pipeline through China would be far more risky and insecure,

with fewer potential benefits. Although building from Tayshet to Nakhodka is a more costly option, it will ultimately bring far greater benefits. By taking into account a larger number of actors (including potential future customers), Russia's cooperation with Japan/China became less predictable. In the game, if China had the same power resource as Russia, the result would be different, or if there were only China and Russia in the game, the result would also change. Due to the existence of long-term absolute gain, Russia chose to build a branch to China to appease China, in order to reduce the revenge in future games. This generates the first hypothesis: two asymmetrical players can achieve co-opetition more easily than symmetrical players, but the more players that join the game, the less stable the game will be.

Table 7: Three Alternatives for Russian Far East Oil (CNPC, 2013)

	Angarsk-Daqing (China)	Angarsk-Nakhodka	Tayshet-Nakhodka Branch:Skovorodino to Mohe (China)
Length (km)	2400	5000	8000
Annual oil delivery	2000(2005-2010) 3000 (after 2010)	5000	8000
Construction cost($100 million)	20	36-50	110-170
Project start time	2003	2004 or 2005	First stage 2006 Second stage 2008
Project end time	2005	2008 or 2010	First stage: 2008 Second stage: 2011

Added Value

Added value can be considered as the degree of complementarity between participants in the game. According to the formula $P=(x+y+Rxy)$, P represents

the common interests of the player, the degree of complementarity is represented by *R*, and the separate profits that player A and B can obtain are *x* and *y* respectively. If *x* and *y* are fixed, the only possible method to increase the two partners' common interest (*P*) – to 'make the pie bigger' – is by increasing *R*. In other words, the degree of complementarity must be reinforced to increase the overall interest brought to both sides. That is to say, the lower the complementarity degree, the less common interest is made. That is to say, in terms of the energy game, one supplier and one customer is better than two customers together. The second hypothesis is therefore that high complementarity can boost the achievement of co-opetition.

Rules

Commitment and reciprocity, or the establishment thereof, comprise the two major strategies in a repeat game for overcoming the security dilemma. There is no meaning attached to binding commitments in a one-player game, but such commitments have value when the number of players is increased to two. (Fudenberg and Tirole, 1991:75) That is because, based on binding commitments, 'by committing himself to a given sequence of actions a player may be able to alter the play of his opponents.' Commitments can also provide a timeframe for the carrying out of actions at certain points.

In the energy game, due to the particularity of energy and a lack of trust, it is always difficult to sustain cooperation over a long period of time. As a result, repeat game was proposed. In the case of a repeated game,

participants can receive information through observing the other party's strategy and the results of the repeated games. (Fudenberg and Tirole, 1991) As a result, with a repeated game, the possibility of cooperation will increase. In the first game, the players will only consider the absolute gains that they can receive, while in repeated games, the parties will be concerned more with the overall effect or average earnings of the game. (Bó and Fréchette, 2009) Consequently, in a repeated game, a 'tit-for-tat' strategy can be employed to establish mutual trust. Within the confines of a repeated game, such as an energy mechanism, if country A takes action choosing betrayal, country B can apply certain sanctions to A (and vice versa).

In other words, establishing binding commitments within a regime can be considered a useful method to help maintain cooperative relations. Commitments can include three different types, namely affective commitments, continuance commitments and normative commitments. (Meyer and Allen, 1991) In terms of the energy game, affective commitment appears more like a desire; it represents the fundamental emotion and drive behind states choosing to cooperate with one another. Continuance commitment plays the role of a need, which can keep cooperation going for a long time. Normative commitment represents obligation, which is influenced by the external environment and reputation. (Zhan and Jin, 2007)

The second rule is reciprocity. Reciprocity can provide a balance point between the public goods game and the private goods game. It can

coordinate interests and reduce the costs of monitoring and sanctions. Furthermore, state cooperation and reciprocity can increase trust over time and enhance the efficacy of institutionalism. That is to say, co-opetition benefits from rules being monitored by institutions, and tactics of co-opetition depend on specific conditions and reciprocal action. According to Axelrod and Keohane (1985), under the existence of conflicting and complementary interest, states have the motivation to produce reciprocity, and this strategy of reciprocity can obtain more gains than other strategies. In addition, reciprocity does not rely on the existence of a central authority and is therefore a cooperative strategy that suits the condition of international anarchy. (Keohane, 1986) In other words, if state A breaks its commitments in the international regime, the remaining states will take actions of revenge, causing the gains of state A to decrease. Thus, reciprocity can reduce expected yields, and so players must consider carefully before making the decision to break commitments. In other words, states in the regime do not need to be supervised by a third party. However, the minimum pre-condition of reciprocity is of course bilateralism; reciprocity is irrelevant for unilateral decision-making. Reciprocity loses its strength in a pure two-player game. In terms of this limitation, Hass's "tactical linkage" strategy intends to make up for this. The objective of tactical linkage is 'simply to obtain additional bargaining leverage, to extract a quid pro quo not obtainable if the discussion remains confined to a single issue.' (Haas, 1980:372) This linkage will change the allocation of

interests and the expected yields at the beginning of the game. Thus, as the assumption seven proposes, establishing commitments is a way to maintain long-term co-opetition, and that reciprocity can improve the establishment of trust.

Tactics

Good tactics can alter players' perceptions[14] and change the result of the game. (Brandenburger and Nalebuff, 1998) Within situations of co-opetition, different players have different positions and standpoints which dictate their respective tactics. For example, in terms of energy security, some states are net producers and others are net consumers, which can bring about different tactics within the game.

In this research, it is assumed that the energy game is based on bounded rationality[15], meaning that the equilibrium can be changed by adjustments in a repeat game. (Hammerstein and Selten, 1995:932) In many ways similarity can be drawn with Darwin's evolutionary theory; the result of the game occurs through adjustments and natural selection. In fact, a related line of argument can be seen in Smith and Price (1973:73): 'In biology strategies are considered to be inherited behaviour which control the

[14] Perceptions play a central role in negotiations. Buyers and sellers often have different views of the pie; sellers portray what they have to offer as valuable, while buyers remain sceptical. (Brandenburger and Nalebuff, 1998)

[15] This research selects bounded rationality, rather than absolute rationality, because although states can be seen as rational actors acting in their own best interests, they cannot guarantee not to make any mistakes. In addition, both the current international situation and historical issues will also influence the choice of strategy.

individual's behaviour.' Game strategy, which follows this sense is defined as an evolutionarily stable strategy (ESS). In brief, an ESS is a strategy whereby, if most of the members of a population adopt it, there is no 'mutant' strategy that would give higher reproductive fitness. However, an evolutionarily stable strategy needs a large sample to prove the veracity of this assumption. (Neill, 2004)

Different tactics depend on specific situations and the information content in the game; as a result, it is difficult to outline the specific tactics of co-opetition. However, differences in tactics deepen when the number of players is increased. If there are two players in a game, the game tactics for A are represented by *x*, and for player B, they are represented by 1-*x*. Then the expected utility of A and B are namely $u1 = x * a + (1-x) * b$, $u2 = x * c + (1-x) * d$, and the average expected return for this group is $u- = x * u1 + (1-x) * u2$.(Hammerstein and Selten, 1995) Therefore, according to the theory of evolution, the player with lower tactical utility will be forced to change their strategies in order to survive. The case study chapters of this research will need to fully consider the existence of ESS, as well as which external aspects influence choices, such as historical factors and current developments. Thus, the fourth hypothesis states that tactics are decided by the situation that the states find themselves in, as well as the player the state is facing.

Scope

Scope (i.e. anticipation for the future) in the game includes two parts, firstly the common interest, and secondly the expected yield. Increasing common interest is the goal of co-opetition. The existence of common interest can be explained by the degree of complementarity and the Game of the Battle of the Sexes (BoS)[16]. In this game, finding the common interest can lay the grounds for the payoff, and both the parties can enjoy a fair arrangement. Whichever player has an insight into the opportunities first can gain the priority and therefore the upper hand. Arriving late to the play is an obvious limitation for an actor.

In addition, games of common interest can be referred to 'as stage games when there is a payoff vector that strongly Pareto dominates all other feasible payoffs.' (Fudenberg and Tirole, 1991:387) They go on to point out that there are other forms of equilibrium in addition to the unique Pareto-optimal payoff. That is to say, pursuing Pareto-dominant payoff is not the inevitable starting strategy of players when stating a game.

[16] BoS assumes that a couple have agreed to meet this evening, but cannot recall if they will be attending the opera or a football match. The payoff matrix is shown as follows. If both of them choose the same entertainment, they can gain more than separating from each other. (Fudenberg Tirole,1991)

Table 8: Payoff Matrices of BoS

	Opera	Football
Opera	(3,2)	(0,0)
Football	(0,0)	(2,3)

Secondly, in terms of long-term scope, absolute gain must be considered. Bargaining is inevitable, because bargaining decides whether players can gain more in the game. As Flatau (2002) notes, the nature of the bargaining model is actually from Stahl and Rubinstein's original model of bargaining. The Stahl model focuses more on the finite-horizon version of the same game (Ståhl, 1972), which depends on the length of the game and which player made the last offer. Fudenberg and Tirole (1991) point out that, Rubinstein's paper extends the work of Ståhl and brings bargaining into the infinite-horizon game. In Rubinstein's model, bargaining is framed without finite time limits, and takes place under the conditions of entity information. Both sides take turns in bargaining. This model is applied to understand how two players can agree to share a pie of size 1 and maintain an acceptable equilibrium. (Rubinstein, 1982) Furthermore, Binmore et al. (1986) assert that bargaining ability is related to the preferences of the players. More patience brings stronger bargaining capability. In addition, risk aversion also affects bargaining capability, and players with a lower degree of risk aversion have a stronger bargaining ability. In other words, in the face of the same risks, the preferences of individual players may affect their ability to bargain and therefore the ultimate gains they are able to obtain.

An important and limiting condition in this game is that both players have a monopoly of some kind, such as being an energy producer or an energy consumer, but in fact, not every player can fulfil this requirement. In the

energy game, this is even a rarity; there are far fewer monopoly producers than consumers. In the ‘strike model’, Hicks (1963) shows that increasing opportunity costs can cause an imbalance in equilibrium. That is to say, in bargaining, the occurrence of a strike can change the expected yield. However, this transformation will not inevitably happen. The limitation of the strike model is the assumption that the players have access to full information, whereas in fact, it is often the lack of complete information, which dictates the differing attitudes of players towards threats. (Cahuc et al., 2014)

Scope refers to the future that players desire; it shows concrete allocation of interests. This research assumes that future scope is predictable and can be coordinated. The following Table 9 shows the outcome after this coordination, which corresponds with BoS. In the conditions of scope being coordinated, there is no leading strategy, but instead two choices of Nash equilibrium. So any player’s performance will support the Nash equilibrium. In addition, it can be found that strong countries tend to consider relative gains, and weaker countries focus on absolute gains. (Hasenclever et al., 1997) In order for any one state to obtain its preferred scenario, it is important to select a partner that matches one’s own aims for future scope. This can create a scenario of ‘added value.’

Table 9: Payoff Matrices of BoS with Coordination

	B (Cooperation)	B (Defection)
A (Cooperation)	(5,3)**	(0,1)
A (Defection)	(1,0)	(3,5)**

In conclusion, co-opetition is most likely to exist between two countries with power asymmetry and high complementarity, decided by commitment and reciprocity. Furthermore, co-opetition will work best when it is consistently supervised by international institutions or regimes. In short, co-opetition can be achieved, but only under certain conditions.

2.3 Supplementing the Deficiencies of Co-opetition: Chinese *Hehe* Culture

The analysis of co-opetition has demonstrated that co-opetitive relations can be reached in IR if three conditions are met: common interests, complementarity and trust. However, there remain many factors in co-opetition which require greater consideration. For example, looking at Figure 4 below, it can be seen that the proportion of cooperation and competition within co-opetition may differ due to the proportion of conflicting and common interests present. *C1>C2* represents cooperation in the leading position over competition; C2>C1 shows competition in the leading position, and *C1=C2* represents cooperation and competition in balance. Co-opetition can exist as long as *C1* and *C2* exist, regardless of whether *C1* or *C2* is larger. The pure

concept of co-opetition does not dictate whether cooperation or competition should take a leading role. However, a traditional Chinese philosophical thought – *Hehe* culture – argues that *C1* (cooperation) being greater than *C2* (competition) is the preferred profile of co-opetition, as excessive competition could cause cooperation to disappear. The tenth assumption here admits that the deficiencies in the concept of co-opetition can be supplemented by the classical Chinese concept of *Hehe* culture, which traditionally attempted to promote the precept of 'harmony by sameness', as will be explained in further detail below. This culture could represent a manner in which to balance competition and cooperation.

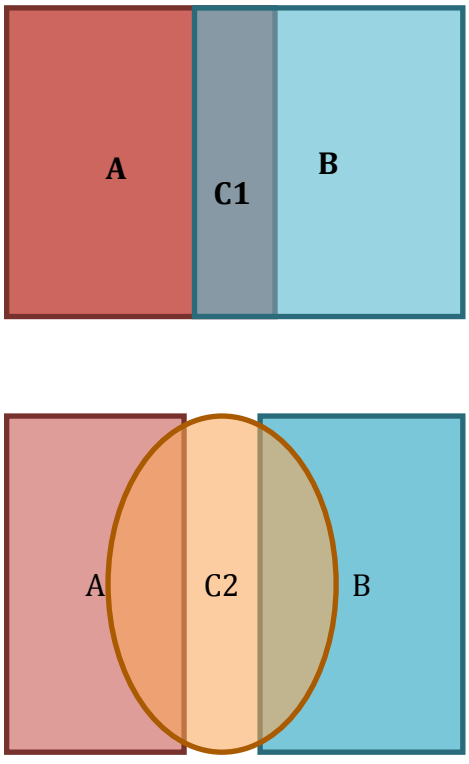

Figure 4: Balance between Competition and Cooperation (A and B: States/ *C1*: Common interest /*C2:* Conflicting interest)(Researcher's own)

2.3.1 The Concept of *Hehe* Culture

The term *Hehe* (和合) is made up of two different Chinese characters which were first inscribed on bones and tortoise shells during the Shang Dynasty and the Spring and Autumn Period in China. These two *he* have the same pronunciation in Chinese but different meanings. The first *he* (和) can mean harmony, neutralisation and peace, and the second '*he*' (合) refers to unity, integration, fusion and co-operation.

Hehe culture was proposed and further developed by the Chinese scholar Zhang Liwen. Zhang (2004) points out that since the dawn of human history, people have always had to face different challenges and conflicts. He sums up four basic kinds of conflicts, namely human and environment, human and society, human and human, and human and sprit. Zhang proposed the idea of *Hehe* to address these separate challenges, dividing the concept into five principles. Firstly: *hesheng* (和生) which means that every group, culture or country should learn from each other rather than simply seeking out each other's limitations. In this way, each actor can develop together. The second principle is *hechu* (和处). This is similar to *hesheng*, but focuses more on how to resolve conflicts arising between actors. The third principle is *heli* (和立) which stresses that different cultures and groups have different values and traditions; one cannot force one's own opinion on others, and must instead allow them to develop freely. This concept also calls for the prevention of hegemony in this vein. The fourth is *heda* (和达) which means aiming to

develop together. Both developing and developed countries should aim to reach the final target of common and harmonious development. Finally, *he'ai* (和爱) means that each actor must love other actors; love amongst people should not involve prejudice. It can be found that *Hehe* culture contains concepts of building mutual trust, accepting and even complementing the development of others. These are the inevitable requirements for the development and co-existence of all parties.

2.3.2 Philosophical Connotations of *Hehe* Culture

In fact, the two *he* characters (和/ 合), meaning harmony and unity respectively, feature heavily in traditional Chinese philosophy. As Ferguson and Dellios (2010) mention, the culture of harmony is implicit cross the most early Confucian doctrinal texts. Until today, the harmony culture entails peace, cooperation and commonality but with differences. In other words, peace is the major target to be achieved, and cooperation is the tool; commonality but differences refers to highly interdependent states living in the same world, but with the differences between individual actors still being taken into account, each playing different roles in the international world. These two characters embrace the broad and profound Chinese culture and spirit. There are three major and guiding traditional ways of thinking in terms of *Hehe* culture.

First of all, *Hehe* culture represents the natural order in traditional philosophy. Chinese culture accepts dialectical logic and considers nature to be the unity of *yin* and *yang.* (Yang, 2005) As Zhang (2006:455) mentions, traditional thought stresses the adage *unity between man and nature* (天人合一, *tian ren he yi*). In addition to peace and harmony, people and nature should unify for the sake of their co-existence. (JI, 2008) This does not mean abandoning differences to become the same, but instead co-existing alongside one another as a harmonious whole. This kind of harmonious co-existence should be established amongst humans. In fact, Confucians also firmly believe that humans should extend this co-existence to nature too. Dong Zhongshu, a Confucian philosopher of the Western Han Dynasty, stated that human, heaven and nature are the three basic elements behind the growth and existence of everything, and they must work together. (Zuo, 2003) In addition, Needham (1959) discusses how, in ancient China, *tian* (天) was seen as a non-human with the power of creation. Every last thing created and in existence has its own internal properties, and all entities must exist through consistent co-operation.

Unity between man and nature not only stresses the harmonious co-existence between human and nature, but also illustrates inclusiveness and the acceptance of difference. All entities, despite differences, form a large whole. All rivers run into sea; the sea is spacious because it contains so much, but the rivers are separate too. (Chuang-Tzu, 1999) As Jiang (2010) notes, the

spirit of *Hehe* can be achieved by recognition of differences, modesty and acceptance. By accepting and working with differences, the balance of power can be kept and peace maintained.

In brief, this concept can be summed up as harmony but not the sameness. As Zhang (2012a) states, this is the fundamental guiding concept of *Hehe* culture. It can be found that *Hehe* includes the concept of accepting difference: diversity and unification, despite their apparent contradiction, can mutually and simultaneously exist. As Xing (1997) states, ancient philosophical ideologies do not deny contradictions and necessary struggles in life. He believes that it is possible to achieve harmony and co-operation through recognition and acceptance of apparent contradictions. From that point, *Hehe* culture can help us to correctly grasp contradictions and learn to transform this into co-operation. Zhang (2011) argues that harmony but not the sameness provides the cultural foundation for Chinese co-opetition theory. In fact, it is similar in approach to universalism in Western culture. It calls for more attention to be paid to the common good and interests, rather than focusing solely on one's own business. (Chen, 2011)

Secondly, *Hehe* culture is a doctrine and ruler approach. It advocates the idea of peace and harmony, stresses the importance of morality, and promotes the functions of education and internationalism. (Deng and lv, 2006) The first way of thinking – peace is precious – refers to the concept of harmony. As written in the *Dao De Jing* written by Lao-Tzu (2008:43) as early

as 2500 years ago: ‘The softest thing in the world dashes against and overcomes the hardest’ (天下之至柔，驰骋天下之至坚, *tian xia zhi zhi rou, chi cheng tian xia zhi zhi jian*). Water is the softest substance in the world, but its constant dripping can wear away a hard stone. Many consider ‘soft’ in this situation to refer to peace and harmony. Thus, a spirit of harmony can even conquer the unyielding and lead to peace.

In addition to this, Lao-Tzu analysed *he* (和) from the perspective of *yin* and *yang*. Lao-Tzu (2008:42) notes that, ‘All things leave behind them the obscurity [out of which they have come], and go forward to embrace the brightness [into which they have emerged], while they are harmonised by the breath of vacancy’ (万物负阴而抱阳，冲气以为和, *wan wu fu yin er bao yang, chong qi yi wei he*). This reference is reflected in Zhang’s principle of *hesheng* in *Hehe* culture. (Xiao and Lei, 2005) This conceptualisation stresses the importance of phases of *yin* (obscurity) and *yang* (brightness), and can be understood as co-ordinating development, and encouraging harmony with nature and even within human society.

Confucius also explains the value of harmony: ‘of the things brought about by the rites, harmony is the most valuable’ (礼之用，和为贵, *li zhi yong, he wei gui*). (Confucius, 1998:I) The original meaning of this phrase described the importance of rites in building a harmonious relationship between slave and slaveholder. In other words, harmony is precious above all and can maintain prolonged stability. The importance of *rites* (礼, *li*), also translated as

morals, is significantly important for the achievement of harmony. *He* can also be achieved through *ren* (仁, benevolence). *Ren* is the key concept of Confucianism, which advocates a harmonious co-existence through moral character. As Confucius (1998:VI) states: 'Now the man of perfect virtue, wishing to be established himself, seeks also to establish others; wishing to be enlarged himself, he seeks also to enlarge others' (夫仁者，己欲立而立人，己欲达而达人, *fu ren zhe, ji yu li er li ren, ji yu da er da ren*). In other words, a good person should learn to share and help others, which ultimately is beneficial to them. In addition, Confucius(1998:XV) states that 'What you do not want done to yourself, do not do to others' (己所不欲，勿施于人 *ji suo bu yu, wu shi yu ren*); that is to say, something which may destroy one's own interests must not be imposed upon others. Only in this way, can both sides build a foundation of trust and co-operation, and can peace exist amongst them. However, the precept 'What you do not want done to yourself, do not do to others' is arguably not suitable for the energy game, especially under the guidance of an international regime. This is because the potential threat of revenge or reciprocation is an important deterrent against betrayal, and if this deterrent is softened, it may cause aggression from some players which ultimately breaks down cooperation.

In addition, the philosopher Chuang-Tuz (1999) considers harmony to be the most precious thing in the world and the only virtue which can maintain world peace. Mencius (2005) emphasises that rulers can obtain the

public's support by not killing (唯不嗜杀人者能一之, *wei bu shi sha ren zhe neng yi zhi*); that is to say, through use of virtue and reasonable morals, peace and even national security can be achieved. Ancient China's rulers considered reputation to be of utmost importance and believed that moral virtue could lead to admiration. Xun-Tuz (1999) states that there are three kinds of rulers: one type wins people over through virtue, the second rules the people with their voice, and the third rules people through arrogance and domination. Only the first can achieve long-term stable rule. All of these traditional philosophical thoughts have created a firm belief in the vital importance of harmony.

Although Chinese culture has long embraced peace and harmony, that is not to say that the military and war are unimportant. Sun Tzu states that as war is significant for a country and relates to the death of people and the future of the country, it should be clearly considered (兵者，国之大事，死生之地，存亡之道，不可不察也, *bing zhe, guo zhi da shi, si sheng zhi di, cun wang zhi dao, bu ke bu cha ye*). (Sun-Tzu, 1971) In other words, in ancient China, the strategist also had to recognise the importance of the military and how to wield it reasonably to directly influence the fortunes of the country. This definition is still followed today, and the modern Chinese government advocates peaceful development. Thus, the military is important, but the Chinese nation states that it hopes to avoid war in its quest for peaceful existence.

Thirdly, *Hehe* culture is an important idealist component of Chinese foreign policy. *Hehe* culture does not deny the importance of power, but it stresses more how power can be restrained and controlled for the sake of harmony and peaceful foreign policy. *He* (harmony) is considered the start and end point of Chinese foreign policy, the stated aim of which is to pursue a natural and moral manner of seeking development and cooperation with other states. Chinese foreign policy advocates peaceful co-existence and independence in order to best achieve harmonious and common development. These applications will be shown in chapter three in the Chinese energy policy section. Furthermore, *he* (unity) is another basic principle for building a harmonious foreign policy which holds that co-existence can be achieved through unity despite the range of different races, cultures and religions, which must be respected across states. (Wang, 2009)

Chinese *Hehe* culture ties together Confucianism and Taoism and fully embodies the Chinese core value of 'harmony but sameness.' That is to say, in the globalised world, countries need to respect each other's sovereignty and territory and tolerate the differences between religions, cultures and ideologies. Only in this way can countries negotiate on global issues, like energy. In fact, the Chinese government has already been incorporating *Hehe* culture into its foreign policy practice.

To sum up, this research has proposed the conditions under which co-opetition can be achieved in international relations, namely, two players

with power asymmetry, ruled and monitored by the international regime, with reciprocal interaction and commitment to build trust to enhance future scope for cooperation. In order to build this theoretical model, this research first analysed traditional disputes of conflict and cooperation as argued by the schools of realism and liberalism, in particular those concerning the importance of international organisations and interdependence between states. Based on the conclusions of this discussion, a theoretical model of co-opetition was generated in line with these assumptions.

Despite identifying a theoretical model for co-opetition, it was noted that maintaining a balance between competition and co-operation is a difficult challenge, and it was proposed that Chinese *Hehe* culture can remedy this limitation. *Hehe* culture involves the idea of 'harmony but sameness', which is reflected not only in traditional philosophy but also in modern Chinese policymakers' approaches. From a Chinese viewpoint, competition for energy is purely to meet the needs of the country; hegemony is a hat that others have placed on China. Some scholars, such as Pomfret (2008), think that China's development should be seen as a challenge for other countries rather than a threat per se.

Nevertheless, with the development of Chinese national power, the influence of China in the world is growing ever larger. *Hehe* culture has given a unique character to co-opetition in China, because it provided a supplementary boost for cooperation and subsequently the establishment of a balanced

co-opetitive relationship. Consequently, *Hehe* culture sufficiently reflected the differences amongst countries and made co-opetition for energy more stable.

Chapter Three: The Application of Co-opetition to China's Energy Policy

Chapter Two clearly demonstrates that the concept of co-opetition can provide a better understanding of energy security, and lays down certain conditions for the successful introduction of a co-opetitive relationship through analysis based on game theory. As the chapter indicates, co-opetition works best between two countries with asymmetrical power, and would require step-by-step supervision globally in order to succeed. In addition, traditional Chinese *Hehe* culture remedies the imbalance in co-opetition when dealing with energy security, and writes co-opetition in Chinese characters.

This chapter will analyse the specifics of China's foreign energy policy in order to demonstrate how the strategy of co-opetition has been applied to China's energy policy since the establishment of 'New China' in 1949 until the present day. However, China's National Energy Administration was officially established as late as 2008, and the short-lived Ministry of Energy existed only from 1988 until its dismantlement in 1993 (Zhao, 2001); there had previously been no single agency responsible for systematically managing China's energy affairs and energy security. Although energy was a fundamental state issue, it typically did not exist as a separate industry and was difficult to categorise within the industrial sector. (Lin, 2012) The most appropriate way to consider the application of co-opetition to China's energy policy prior to the development of the National Energy Administration was thus

to consider co-opetition within national foreign policy. The overall foreign policy of a state can often be divided into more specific sectors, including energy. The focus of this research is on co-opetition within China's energy policies, but in this regard it is valuable to trace back to the root of China's modern foreign policy in order to discuss the development and background 'push factors affecting foreign energy policy.

This chapter will therefore combine a brief study of the essence of China's foreign policy with a more specific look at China's energy policy, and will be divided into three broad parts. The first part will reveal the trends of China's energy policy through the lens of modern foreign policy approaches. The concept of *Hehe* culture proposed in Chapter Two is an important element in this part: although the various eras of Chinese leadership have expounded different approaches depending on diverse political conditions and requirements, the harmony and unity espoused by *Hehe* culture have remained core traditional philosophical values, and have provided a starting-point for China to handle foreign relations with other states. Following this discussion of Chinese foreign policy, the chapter will move on to analyse the development of China's energy policy, which has been showing a clear trend in moving away from self-sufficiency towards co-opetition. Finally, three specific applications of co-opetition within Chinese energy policy will be analysed in depth: energy supply, energy reserves and emission reduction. Looking at the government's action plan and energy white papers, this section

will cover policies on various related aspects such as energy supply and exploitation, the establishment of energy reserves, technological exchange, cooperation over clean energy sources, the development of new energy sources, and emissions reduction.

3.1 The Development of Co-opetition Reflected in China's Foreign Policy

Judging from the pervasive trends of China's foreign policy since 1949, it seems that the idea of co-opetition has run through each era and represents a logical choice for China's foreign policymakers. It is possible to divide New China's foreign policy into different periods which reflect China's adjustment to domestic requirements for development and changes in international circumstances; one such division is the six periods of China's Diplomacy[17] put forward by Wang Yizhou. However, the Chinese government is a one-party government, and it is the top party elites who engage in the formulation of overarching strategies. In other words, policy selection and formation remain in the hands of a group of governmental elites, whose decisions navigate the future direction of China's international relations and national development. Feng (2007) therefore suggests that, rather than dividing foreign policy into arbitrary periods, discussing the beliefs of individual Chinese leaders is more

[17]The six periods of China's foreign policy are: 1949-1955, 1956-1966, 1966-1976, 1976-1992, 1992-2002, and 2002-2012. (Wang, 2013a)

useful for a comprehensive and complete understanding of Chinese policy behaviour. In addition, as Cheng and Zhang (1999) indicate, each Chinese leadership has established its own model in respective eras, in effect dividing the history of Chinese foreign policy into different periods with different guiding ideologies. Discussing the proposed strategies of individual leaders can provide greater understanding of how co-opetition works within Chinese foreign policy. This research will thus analyse the foreign policy and aspects of co-opetition featuring in policies under the various state leaders. The following section will expand upon the development and differing approaches of foreign policy in the chronological eras of respective Chinese leaders in order to consider the development of co-opetition.

3.1.1 China's Foreign Policy in Different Eras

Various policies have existed in the different eras of leadership since the founding of China in 1949, but each leader can be associated with at least one major approach to foreign policy. Table 10 shows these different major approaches, which are explained individually below. Importantly, these major approaches can be seen to incorporate the comprehensive manifestation of co-opetition in China's foreign policy over the long-term.

Table 10: Guiding Approaches of Different Leaders (Researcher's own)

	Mao Zedong[18]	Deng Xiaoping	Jiang Zemin	Hu Jintao
Major Approach	Five Principles of Peaceful Co-existence[19]	1.Building a cooperative pattern 2.Peaceful development	Harmony but not sameness	1. Peaceful Rise 2.Harmonious Society

Five Principles of Peaceful Co-existence: Mao Zedong

The *Five Principles of Peaceful Co-existence*, introduced by Mao Zedong, represented the first major contribution to co-opetition in Chinese foreign policy. In Mao's era, a range of different foreign policies were rolled out, including the 'set up a separate kitchen[20],' 'lean to one side[21],' and 'three world'[22] policies, each of which responded to the challenges of different international issues. (Wei, 2013) But the *Five Principles of Peaceful Co-existence* was instead a guiding ideology which ran consistently through Mao's foreign policy approach, and which has continued to significantly influence foreign policy to this day.

[18] Mao Zedong is also rendered as Mao Tse-tung.

[19] The Five Principles of Peaceful Co-existence were conceived by Zhou Enlai and drafted by Mao Zedong, and include mutual respect for territorial integrity and sovereignty, mutual non-aggression, non-interference in each other's internal affairs, equality and mutual benefit, and peaceful co-existence. (Xinhua News Agency, 2004)

[20]'Set up a separate kitchen' is a Mao policy that was proposed in the early stage of New China. It means the New China government will build new relations with other states and will not admit all the relations built with the Chinese Nationalist Party before 1949. (Zhou,1952)

[21]The 'lean to one side' policy was proposed by Mao Zedong and this policy indicated that China stands in the camp of Soviet Union at the beginning of the establishment of new China. Ibid.

[22]The 'Three Worlds' refers to the Cold War superpowers, their allies, and non-aligned countries.(Mao,1994)

The *Five Principles of Peaceful Co-existence* were officially established in June 1954 as a joint declaration with the governments of India and Burma. However, in the 'Proclamation of the Central People's Government of the PRC' in 1949, Mao (1949a:para.2) had already declared that the 'Chinese government is willing to establish diplomatic relations with any foreign government that is willing to observe the principles of equality, mutual benefit, and mutual respect of territorial integrity and sovereignty,' a statement that is widely seen as the predecessor to the *Five Principles of Peaceful Co-existence*.

Mao believed that all countries, no matter how big or small, rich or poor, strong or weak, should respect all others. (Mao, 1949b) This principle of mutual respect was consistently deemed the most important core principle out of the five. (Office of Ministry of Foreign Affairs of the People's Republic of China, 2014a) This reflects Mao's belief that states are the major actors in international society, and that other actors cannot supersede their position. It is important to note that this idea ties in with *Hehe* culture, as every country has the right to choose different social systems and development models; no country can rightfully impose their culture, religion, or social system on others. (People's Daily, 2014) In other words, this policy is designed to recognise and respect differences in order to reflect *Hehe* culture. Adherence to the *Five Principles of Peaceful Co-existence* supplies the fundamental conditions for co-opetition.

Nevertheless, although the Five Principles represented the ostensible main approach to foreign policy during Mao's era, the actual success of the policy was limited in its reach. The *Five Principles of Peaceful Coexistence* supplied a platform for co-opetition, but there was not enough substantive development of the approach during Mao's era (particularly 1950-1970), as he put far greater emphasis on domestic class struggle. (Wang, 2013a)

One major impediment to efforts towards co-opetition during this era was the emergence in the late 1950s of the slogan '*zi li geng sheng*'[23] (自力更生, self-reliance), an extension of China's quest for independence and self-sufficiency. Breslin (1998) argues that China's relative isolation in the era of Mao can be seen as a result of Mao's policy of self-reliance, brought in due to Mao's suspicion and doubts concerning commercial trade with other countries, even those in the socialist bloc. However, according to Yahuda (1983) the slogan has been haphazardly applied by scholars to describe a variety of different policies from virtual autarky to the importing of a wide range of agriculture products and industrial plants.

In 1945, Mao declared that 'we stand for self-reliance. We hope for foreign aid but cannot be dependent on it; we depend on our own efforts, on the creative power of the whole army and the entire people.' (Mao, 1977d: 719) From this statement, it can be seen that the original goal behind the slogan

[23] *Zi li geng sheng* was formally proposed in 1958 in the report to enact the Second Five Year Plan. This concept represented an important aspect of Mao's thinking at the time and played an instrumental role in domestic and foreign policies in the 1950s to 1960s. (Wang,2001)

was to avoid dependence and raise national dignity. At the heart of Mao's concept of self-reliance was the struggle for third world countries to achieve national liberation, and for apparently militarily inferior developing countries to achieve independence from external powers. (Mao, 1994) Although Mao's approach is widely touted by the Chinese to have ensured China's survival and secured its emergence as a great power, China's support for the revolutionary struggles of others has been marginal and largely conditional on China's relations with other countries. Mao's idea of self-reliance may be said to focus excessively on conflictual elements of global superpower politics (Yan, 2009), leading to difficulties in establishing policies based on a cooperative pattern. What's more, with hindsight, the slogan now appears to be somewhat unrealistic. Particularly in terms of energy, it would be impossible to relieve uncertainty in China's energy security by blindly pursuing self-reliance.

Co-opetitive efforts seem to have been relatively feeble during this stage of China's foreign policy development, and one reason for this was that China was too weak to establish common ground with others on a consistent basis. Mao therefore stressed self-reliance and increasing domestic strength. In the early Mao era from 1949 to 1955, 22 countries established formal relations with China, and most of them were poor African countries. (Wang, 2013a) Further to this, 24 more so-called *poor brothers* in Africa established relations with China between 1956 to 1966. (Wang, 2013a) This hints at the good relations between China and African countries in case three that follows.

Why was it only under-developed countries that wished to cooperate with China to begin with? Of course, other aspects of the international dynamic at the time, such as China's rupture with the Soviet Union from the late 1950s, played a part in China's increasingly closer relations with countries such as those on the African continent. External pressure could have motivated China to cement closer cooperative relations with others. But during this time period, China was a developing country, and was therefore able to cooperate as an equal with other developing countries. Now that China has developed so rapidly, the gap in developmental levels compared to African countries has grown, which may pose challenges for successful co-opetition in the future. This possibility will be discussed at greater length in the case study in Chapter Six, exploring the application of co-opetition with African countries to China's energy security.

The *Five Principles of Peaceful Co-existence*, although put forward by Mao, did not develop particularly well during Mao's era and adversely affected the possibilities for co-opetition. However, subsequent Chinese leaders have continued to advocate this standpoint and develop it more effectively. For example, Deng Xiaoping stated that China should improve and cultivate relations with developed countries beyond the scope of differences in social systems and ideologies. (Deng, 1993b) Later, Jiang Zemin reiterated that China needs a lasting peaceful environment in which to cooperate and respect others based on Mao's *Five Principles of Peaceful Coexistence.* (Jiang,

1995a) Recently, President Xi Jinping delivered a keynote speech at a conference marking the 60th anniversary of the *Five Principles of Peaceful Coexistence* in 2014, in which he stated that the *Five Principles of Peaceful Co-existence* are not outdated and remain as relevant as ever. (Fu, 2014) According to the speech addressed by President Xi (2014:para.5), 'these five principles, as an integrated, interconnected and indivisible concept, capture the essence of today's international relations, and can apply to relations amongst all countries regardless of their social system, stage of development or size.' This indicates the Chinese government's stance that the *Five Principles of Peaceful Co-existence* are welcomed not only in cooperative relations between China and other countries, but also between other countries. In fact, in 1970, key concepts of the Five Principles were incorporated into a United Nations declaration on international law (United Nations, 1970), suggesting that China's foreign policy ideology is accepted by international society.

Furthermore, according to the *Five Principles of Peaceful Co-existence*, a *zero-sum* approach to international relations cannot assist development; what is needed is cooperation. (Fu, 2014) In the press release, President Xi declares that 'we should champion a new vision of win-win outcomes for all and reject the obsolete notion of *zero-sum* game or winner taking all. Countries should respect others' interests while pursuing their own and advance common interests of all.' (Fu, 2014:para.6) These notions of

respect and common interest derive from the *Five Principles of Peaceful Co-existence* and clearly remain a crucial element of China's overall foreign policy strategy today.

In conclusion, due to China's internal affairs and emphasis on class struggle and self-reliance, as well as contributing international factors, the *Five Principles of Peaceful Co-existence did* not develop concretely in the era of Mao Zedong. Rather, the most important contribution in this era was that Mao's Five Principles sowed the seeds of co-opetition. The *Five Principles of Peaceful Coexistence* are replete with the essence of *Hehe* culture, and reflect an embryonic conceptualisation of co-opetition.

Cooperative Pattern and Peaceful Development: Deng Xiaoping

Deng Xiaoping was the second paramount leader of China, and his policies can be seen as a comprehensive expression of co-opetition. Establishing a co-operative pattern and achieving peaceful development were important aims in the era of Deng Xiaoping. Deng (1993a) asserted that independence is the root and peaceful development is the topic. In other words, ensuring independence is an inevitable prerequisite for building peaceful international relations. Deng Xiaoping re-addressed the importance of self-reliance, maintaining that territory and sovereignty are sacrosanct, and that no state should interfere with other states. However, Deng placed far greater emphasis

on cooperation (Marti, 2014), thus contributing greatly to the development of co-opetition in China's foreign policy.

Deng famously stated that China should 'hide our capacities and bide our time' (韬光养晦, *tao guang yang hui*) whilst seeking common points and respecting differences. (China News, 2012:para.5) Deng saw that this would be most conducive to peace and could avoid the outbreak of conflict or war. Friedberg (2011) points out that, 'hide our capabilities and bide our time' is part of a slightly longer 24 character strategy[24] which brought about a new strategic directive to confront U.S. hegemonists and U.S. allies. However, if capabilities are kept hidden, other players in the game may not recognise accurate information and within the understanding of ESS, this lack of complete information can lead to misunderstanding. As a result, Deng had to tread carefully in order to focus on developing cooperation and skilfully sheltering from competition.

Furthermore, Deng (1993b) consistently believed that the most important issues in the world were peace and development. If peace could not be guaranteed, development would struggle to occur. In terms of peace, Deng saw that a leader needed to consider a country's long-term interests, but must also respect other countries' interests. (CCCPC Party Literature Research Office, 2004) In other words, differences in ideology amongst countries should not be paid attention to, and instead leaders should see every country as equal

[24]Observe calmly; secure our position; cope with affairs calmly; hide our capacities and bide our time; be good at maintaining a low profile; and never claim leadership (China News, 2012)

and independent in essence. In this sense, Deng had identified one of the key foundations for establishing long-term cooperation. This approach coordinated the idea of *harmony but not the sameness* mentioned in the *Hehe* culture of traditional Chinese philosophy.

In addition, Deng Xiaoping also predicted the scope of co-opetition in China's foreign policy. 'Setting aside differences and pursuing joint development.' push China must affirm sovereignty, any unresolved territorial conflicts should be temporarily put aside in order to promote co-operative developmental efforts. (Office of Ministry of Foreign Affairs of the People's Republic of China, 2014b:para.1) This did not mean that sovereignty was ceded, but rather that competition would be shelved at detrimental times in favour of cooperation. Carrying out joint development projects in disputed territories would also help establish mutual understanding through cooperation, and create conditions to rationally solve sovereignty issues Deng saw that joint development can increase opportunities for cooperation, and can help build a bigger pie for all parties.

The major foreign policy approaches espoused by Deng Xiaoping – establishing a co-operative pattern and achieving peaceful development – paved the way for the success of co-opetition. It could be said that whereas Mao Zedong sowed the seeds for co-opetition in China's foreign policy, it was Deng Xiaoping who fertilised and nurtured the seeds.

Harmony but not Sameness: Jiang Zemin

Harmony but not sameness is the major approach to China's foreign policy that Jiang Zemin promoted. This approach is a direct reflection of *Hehe* culture and readdresses the conditions needed to achieve long-term cooperation. As Zhang and Cheng (1999) state, both the approaches of Mao Zedong and Deng Xiaoping significantly influenced the evolution of China's foreign relations strategy, which inevitably brought about far-reaching influence over their successor, Jiang Zemin. The following speech is selected from Jiang Zemin at George Bush Presidential Library in 2002:

> In human relationships, a gentleman seeks harmony but not uniformity. That is to say, harmony but not sameness; reserving differences without coming into conflict. Harmony promotes co-existence and co-prosperity; whereas differences foster mutual complementation and mutual support. Harmony without sameness is an important principle in the development of all social affairs and relationships and in guiding people's conduct and behaviour. Indeed, it is the essential factor of the harmonious development of all civilisations. (Jiang, 2002:para.14)

The above speech shows that President Jiang followed the principle of *harmony but not sameness*. He believed that the world is blessed with great variety, and that states can co-exist best through harmonious cooperation

despite their differences. Jiang also noted the importance of interdependence in foreign policy. States in the world are increasingly interdependent and have little choice but to co-exist with others. According to Jiang (1995a), no state can function alone in today's modern world system. Under such conditions, *Hehe* culture is ever more appropriate for China's modern policy.

Alongside *harmony but not sameness*, Jiang proposed the concept of *Comprehensive National Security*, which requires the Chinese government to monitor the military and also develop politics, the economy and technology together. (Hou, 2000) This mirrors the nature of co-opetition, which integrates the economy, military and environment. The Chinese government places great emphasis on the importance of NTS. In the process of achieving comprehensive security, a state should build mutual trust, mutual benefit, equality and cooperative values in order to establish cooperation. As Lu (2003) explains, comprehensive security requires international society to observe security issues from a much broader angle, making allowances for the fact that core national interests and values differ from country to country.

Jiang (2010) believes in the traditional Chinese thinking that all things should cooperate harmoniously and develop together through embracing differences. Only by considering the interests of others and allowing all stakeholders to obtain profit can harmony be achieved. Thus, Jiang (2010) consistently states that in terms of the issue of global security, China should consider its own position and the position of others to develop a

new strategy. In this way, China could contribute its own power to protect public goods and become a responsible power. Jiang (1995b) also noted that China's *Reform and Opening Up* and modernisation require a long-term peaceful international environment, which involves every country respecting each other. He continues to argue that, as such, the world needs China, and that the world's peaceful development requires China's prosperity and stability.

In conclusion, Jiang Zemin focused on developing co-opetition by emphasising the idea of *harmony but not sameness*, as well as sparking specific suggestions for achieving co-opetition through the pursuit of NTS. Jiang's approach therefore also helped develop and nurture China's commitment to co-opetition in foreign policy.

Peaceful Rise and *Harmonious Society*: Hu Jintao

In the 10 years of Hu Jintao's era, China witnessed unprecedented economic development. According to data from *The Wall Street Journal*, China's average annual economic growth rate was over 10% during this time; this rapid economic growth also made China the world's second largest economy after the USA. (Orlik, 2012) This monumental development can be seen as the consequence of China reaping what had been sowed long before. As Wenzel (2011) explains, the policies of Hu Jintao's era are driven by the Tenth Five Year Plan, a series of economic initiatives which were established under Deng Xiaoping.

However, China's development can also be attributed to enhanced efforts at international cooperation by Hu Jintao. In his keynote speech at the *Bo'ao Forum of Asia* (BFA) 2004 Annual Conference, Hu Jintao admitted the importance of cooperation in the economic development progress, as the development of China's economy has injected fresh vigour into the Asian region. China has therefore benefitted extensively from various Asia-based cooperation mechanisms. The future target will be to promote more bilateral level cooperation in the Asia region. (Hu, 2004a)

Within Hu Jintao's foreign policy, China's *Peaceful Rise* and the construction of a *Harmonious Society* are two related major approaches which heavily feature the principles of co-opetition. Both of these approaches involve peace and harmony, which are a reflection of China's traditional *Hehe* culture, and both provide wide scope for developing co-opetition.

In terms of the *Peaceful Rise*, Hu (2003) gave a speech at the 110th anniversary of the birth of Mao Zedong in 2003, in which he declared that the Chinese Communist Party will insist on continuing to follow the socialist road with Chinese characteristics, leading to the great revival of the Chinese nation. Adherence to this road requires the implementation of a concept entitled the *Peaceful Rise*, which consists of maintaining cordial relations with other countries based on the *Five Principles of Peaceful Coexistence*, and actively carrying out exchanges and cooperation with other countries on the basis of equality and mutual benefit, in order to make a greater contribution to global

and national peace and development. The peaceful development of China can help maintain world peace, and the win-win conditions available under harmonious circumstances are the basic prerequisite for both China's own revival and its continued contribution to the world. (Zhao and Xiao, 2010) Needless to say, Hu's approach has been largely shaped by the viewpoints of China's former leaders and elite, whilst also delivering a new contribution to guiding China's foreign policy under the auspices of co-opetition.

With regards to *Harmonious Society*, in 2004 the Sixteenth Chinese Communist Party Central Committee held its Fourth Plenum (Plenary Session), in which it explicitly put forward the concept of *building a harmonious socialist society.* (CCTV, 2004) Since then, the word *harmony* has appeared throughout the Communist Party's official reports and literature. Whilst it began as a template for domestic stability, Hu soon brought this concept into the field of foreign policy by formally proposing the construction of a *harmonious world* at the Asia-Africa Summit in 2005. He elaborated that China's foreign policy aims to safeguard world peace and promote common development; furthermore, China remains a developing country, and so, in the process of building a harmonious world, enhancing solidarity and cooperation with developing countries is one of the cornerstones of China's diplomacy. Further to this, Hu (2005) made a speech at the 60th anniversary summit of the founding of the United Nations, entitled *Build towards a Harmonious World of Lasting Peace and Common Prosperity*. In this speech, he proposed that countries should

aim to keep a tolerant spirit and build a world based on harmony. From August 2006, *building a harmonious society* became China's formal guiding foreign policy principle. During the Central Foreign Affairs Work Conference, Hu (2006a) proposed six ways in which China must persist in its goals; one of these was the construction of a *harmonious world*. In fact, these two major guidelines of Hu's foreign policy are closely related: promoting and maintaining the construction of a harmonious world is an inevitable background requirement and condition for the achievement of peaceful development.

Despite this, Scobell (2004:V) argues that, 'China's strategic disposition cannot accurately be characterised as either pacifist or bellicose.' That is to say, it is still difficult to build a relationship of long-term trust. Although it is difficult for outsider to judge whether China truly favours peaceful cooperation or tense competition, it can be stated that the concept of co-opetition provides an excellent explanation of China's seemingly equivocal strategic disposition. The balance towards greater competition or greater cooperation would depend on the situation in which China finds itself.

China currently continues to reiterate how important it is to make competition and cooperation work together. The Chinese government has begun to change the way that competition is viewed, rejecting it as a pure threat and instead framing it as a counterbalance to cooperation within the practice of co-opetition. For instance, at the summit of the Shanghai Cooperation Organisation (SCO) in 2009, Hu Jintao declared that China would

‘honour its commitment and continue to support the multilateral and bilateral project cooperation within the SCO framework. To that end, China will provide US$10 billion of credit to support the efforts of SCO member states of addressing the international financial crisis. (Office of Ministry of Foreign Affairs of the People's Republic of China, 2009) This indicates that the Chinese government has started to pay attention to relations amongst countries and has offered a cooperative assistance even with neighbouring competitors.

Hu Jintao asserts that the peaceful rise of China can help maintain world peace, and that the win-win conditions available under harmonious circumstances are the basic requirement for China’s revival and China’s continued contribution to the world. (Xiao and Lei, 2005) China’s peaceful rise provides a degree of evidence to demonstrate that China hopes to peacefully engage in cooperation with other countries.

In conclusion, after analysing Mao Zedong’s *Five Principles of Peaceful Coexistence*, Deng Xiaoping’s *Cooperative Pattern and Peaceful Development*, Jiang Zemin’s *Harmony but not Sameness*, and Hu Jintao’s *Peaceful Rise* and *Harmonious Society*, it can be found that China’s contemporary foreign policy reflects the essence of the ancient *Hehe* culture, and has done so in a continuous, unbroken line from leader to leader. This reflects Chinese leaders’ wish to make efforts towards peaceful cooperation without compromising on differences. China’s major diplomatic guidelines and

approaches have been slightly modified over the different leadership periods, in order to adapt to new global realities, but it is possible to see in these modifications the evolution and development of the concept of co-opetition within China's foreign policy.

3.1.2 Common Vision, Different Approaches

In spite of the various modifications to Chinese foreign policy, it is clear to see that the overall guiding influence has not changed over time; the pursuit of co-opetition has been a stated aim of the PRC ever since its founding and this can be attributed to the commitment to *Hehe* culture. Chinese *Hehe* culture plays an important role in promoting both national unity and international peace. (Xing, 1997) From Mao's era to the Hu's era, there has been a continuous line of leaders declaring peace and harmony as the core coordinating ideologies behind policy stances. In fact, as early as 1949, Mao (1949a) declared that China will never seek hegemony. In 1974, when Mao met with Kenneth Kaunda, the President of Zambia, he put forward his theory of the *Three Worlds* and reemphasised China's opposition to hegemony and aims to closely align with Asian and African states. (Jiang, 2014) As Li (2006a) concludes, the foundation and key source behind today's *Peaceful Rise* appeared from the beginning to end of Mao Zedong's foreign policy.

In Deng's era, during the Third Plenary Session of the Eleventh Central Committee of the Chinese Communist Party, it was concluded that the outbreak of a large-scale war would be unlikely for the foreseeable future. As such, promotion of peace and development should take priority over preparing for war around the world. (Xinhua News Agency, 1978) It was during the Deng era that Chinese foreign policy began to stress the need to seek common points whilst putting differences aside. According to Deng (1993b), China had to take a radically different stance to that of the Soviet Union at the time. Rather than confronting capitalist countries, undertaking class struggle, and secluding the country from outside influences, China would work to promote a socially productive, peaceful world. Since this time, Chinese foreign policy modifications have all been made in the name of continuing down the path to achieving this global ambition.

Since the period of Jiang Zemin to that of Hu Jintao, the importance of peace has been more widely explored and debated, culminating in the formation of the *Peaceful Rise* concept. According to formal documents of the CPC (2004), the strategic thought behind China's *Peaceful Rise* has important theoretical significance and practical value, representing a significant innovation to Chinese foreign policy and symbolising China's international goal to transform from self-sufficiency and introverted policies to extroversion and interaction with the global community. Co-opetitive policies are justified and appropriate in the pursuit of these goals.

In sum, it can be said that China's leaders have demonstrated a long-running common vision regarding the overall aims of China's foreign policy – the use of co-opetition in order to bring about benefits for all. Yet as competition is an inevitable aspect of global relations, China has been focusing on how to maintain cooperation within this competitive framework. China's leaders have shown different approaches to this over time, despite their overall common vision.

The first difference is visible in cooperation tactics. For example, in the earliest years of the Mao era, it was believed that standing alone without the support of either the Soviet Union or the United States was unwise, and that finding a friendly neighbour in the Soviet Union could assist development and create a win-win situation for both. As a result, Mao (1994) explained that alliance was considered the best choice, and so in 1949, China signed the *Sino-Soviet Treaty of Friendship, Alliance and Mutual Assistance*, marking the foundation of a formal alliance between the Soviet Union and China.

However, after ideological differences created a rift between the two neighbours, Deng Xiaoping and his successors instead opted for a stance of non-alignment. Although peaceful cooperation was still a must, China would not align with any Cold War superpower or third party nation, but instead maintain a neutral position. In his speech entitled *We must safeguard world peace and ensure domestic development* in 1984, Deng stated:

> China's foreign policy is independent and truly non-aligned. We will not play the 'United States card' or the 'Soviet Union card.' Nor will we allow others to play the 'China card.' The aim of our foreign policy is world peace. Always bearing that aim in mind, we are wholeheartedly devoting ourselves to the modernisation programme to develop our country and to build socialism with Chinese characteristics. (Deng, 1993b:217)

This quotation reflects China's complete transformation from having a close alliance with the Soviet Union to being a neutral, non-aligned state aiming to cooperate widely with others, which remains China's stance today. However, the very first overseas visit paid by China's new president, Xi Jinping, was to Russia, prompting questions over whether China is remaining entirely neutral. Chen Yurong, the Secretary-General of the Shanghai Cooperation Organisation Research Centre quickly responded that the relationship between China and Russia is non-aligned and not related to any third country, and that questions regarding the relationship between the two come about as a legacy from the Cold War mentality. (Xinhua News Agency, 2013b) In fact, constructive strategic cooperation between the two influential countries of China and Russia is an important foundation for world peace and stability, and aims to steer the international political and economic order in the direction of win-win development. The evolution of the relationship between China and

Russia is evidence of the different approaches of Chinese leaders towards methods of cooperation.

A second difference in foreign policy approaches regards China's partners. In Mao's era, cooperative partners were mainly limited to the Soviet Union, other socialist countries in Eastern Europe, and some third world countries. Mao (1994) proposed three principles of foreign policy: firstly, create solidarity between all the countries in the socialist camp; secondly, build relations with certain Asian, African, Latin American and Nordic countries; and thirdly, do not strive to establish diplomatic relations with major Western countries. It can be said that cooperation policies at that time were selective and limited.

However, during the era of Deng Xiaoping, the scope for cooperative partners was enlarged. Upon the proposal of his *Opening* and *Reform policies*, Deng (1993b) declared that building friendly relations and positive cooperation was no longer limited to socialist or developing countries, but also extended to developed countries. Furthermore, this position has been retained to this day. For example, in his report at the 18th National Congress of China, Hu Jintao stated:

> We call for promoting equality, mutual trust, inclusiveness, mutual learning and mutually beneficial cooperation in international relations and making joint efforts to uphold international fairness and justice.....Countries should establish a new type of global development

> partnership that is more equitable and balanced, stick together in times of difficulty, both share rights and shoulder obligations, and boost the common interests of mankind (CPC, 2012:XI).

This report reflects rigorous aims for global cooperation, but does not draw divisions between countries. In other words, Chinese foreign policy has moved on from focusing on limiting cooperation to a select number and type of partner, to considering how to build mutual trust and confidence and promote a cooperative atmosphere on a global scale.

A third difference between the approaches is a different emphasis. Different political conditions through the years have created new conditions and challenges for China's declared foreign policy stances. For example, in terms of self-reliance, Mao mentioned in 1945, China must intensify the feeling of national self-respect and faith in themselves, but without boycotting foreigners. Besides this, Mao strongly felt that China's development depended on the people of China themselves, and that only the power of people can bring about historical developments. (Mao, 1977b) He consistently stressed that although China may desire the assistance of foreign powers, it must not depend on others but instead depend on the creativity and development of the Chinese people. Although such a declaration inevitably led to issues of isolation, the Chinese government invested a great deal during Mao's rule to exploit domestic resources in order to reduce any dependence on foreign

imports. This approach had a huge knock-on effect on the early years of China's energy policy, which, as will be explained in greater detail subsequently, tended towards total self-sufficiency rather than cooperative efforts.

However, Deng Xiaoping took a markedly different approach. Although he did believe that China need to employ its own creative power, it was vital for China to accept help from foreign powers with more advanced experience and technology. (Deng, 1993b) As a result, China under Deng's guidance became much more open to cooperation with foreign nations and companies, and began to build up more and more interdependent relations. Nevertheless, increased cooperation did not mean giving up independence; China was still able to make decisions away from the influence of other powers, yet gained the benefit of a peaceful background within which to develop, in common with others.

Although each leader's approach has a slightly different manifestation, the same overriding vision has existed throughout. The objective of establishing long-term and lasting co-opetition through promoting peaceful coexistence has never changed. Vice Foreign Minister Zhijun Zhang (2012c:para.4) declares that China would adhere 'to the independent foreign policy of peace and the path of peaceful development, to the win-win strategy of opening up and friendship and cooperation with all countries on the basis of the *Five Principles of Peaceful Coexistence* and to the construction of a

harmonious world of lasting peace and common prosperity.' In other words, modern China seeks commonalities whilst putting aside differences, an exact reflection of the principles of traditional *Hehe* culture, and of the balance between competition and cooperation found within the concept of co-opetition. Thus, China's contemporary foreign policy has generated a consistent framework of global co-opetition, and has reflected the essence of *Hehe* culture, in a continuous, unbroken line from leader to leader. This reflects Chinese leaders' wishes to make efforts for peaceful co-opetition without compromising on differences.

Consequently, China's long-term foreign policy framework and guiding ideology have created a preference for the application of co-opetition, which will in turn succeed best under the conditions laid out in Chapter Two. The following section will look more specifically at China's energy policy in order to draw out evidence of co-opetition.

3.2 Transformation of China's Energy Policy: From Self-Sufficiency to Co-opetition

Section 3.1 considered the major approaches of China's foreign policy in the modern era. Foreign energy policy is for the most part heavily influenced by a state's overall foreign policy. The specific case of energy-related foreign policy

can thus be seen as a microcosm of the wider picture of China's foreign policy as a whole.

Of course, it is debated whether the co-opetition that is so marked in China's foreign policy approach also appears within the energy sector. But, there is no doubt at all. In fact, co-opetition in foreign energy policy is a step up from slight attempts at cooperation to intense cooperation. Due to the particularity and interdependent nature of global energy issues, China's determined transformation from absolute self-sufficiency to win-win co-opetition is particularly evident in energy policy. This section will discuss why this transformation occurred and how it influences co-opetition over energy.

In general, the transformation of energy policy from absolute self-sufficiency to win-win co-opetition has been determined by different leaders' approaches in different eras, as well as by the specific energy requirements at the time. In other words, China's energy diplomacy is one particular facet of the entire foreign policy, thus embodying the formulation and implementation of the decisions of respective Chinese governments over different leadership periods. It can be understood that energy self-sufficiency is the result of a desire for self-reliance, and that current trends towards co-opetition reflect the need for cooperation to balance China's energy security. As such, different solutions have been called for at various times to respond to different challenges and issues. Thus, the changes to, and development of,

China's diplomatic guidelines have determined the specified direction of energy policy.

Primarily, from the establishment of the PRC in 1949 until 1978, when *Opening Up* and *Reform* policies began to take hold, China's policy towards energy called for absolute self-sufficiency. As a result of Mao's commitment to self-reliance, international cooperation in any field was rare during this time. What's more, due to the split with the Soviet Union, and the country's own relatively isolated position, China had little choice but to depend on itself for fuel resources. (Wang, 2013a) Nonetheless, China's objective of energy self-sufficiency during this period was largely due to the overall trend for self-reliance, and did not mean that cooperation with other countries over energy was frowned upon per se. In fact, in some ways, China's quest to secure energy resources during this period led to greater opportunities for co-opetition at later times.

For instance, due to Mao's approach to enhancing and accelerating industrial construction, as proposed in the First Five Year Plan (Li, 1955), there was a huge demand for energy, just as China was unwaveringly promoting self-reliance. As a result, the race was on to locate domestic energy sources to fuel this industrial push. The discovery of the Daqing[25] oilfield in 1959 fundamentally solved China's initial energy requirements for industrialisation.

[25]Daqing is an oilfield which was discovered by Li Siguang in 1959. Formal output began in 1960. Daqing is one of the oldest and most prolific oilfields in China, constituting 21% of China's overall production up to 2009. (China National Petroleum Co. 2010)

(China National Petroleum Co., 2010) In order to promote industrialisation, Mao proposed the slogan *in industry learn from Daqing*, to promote self-reliance. (Li, 1994) The concentrated development of the Daqing oilfield has now, however, potentially provided a cooperative opportunity for China. Daqing is the door to a branch of the Sino-Russian Far East oil pipeline, which will transport 15 million tonnes of crude oil from Russia to China annually between 2011 and 2030. (Xinhua News Agency, 2011a) In other words, without the discovery and development of the Daqing oilfield due to commitment to self-sufficiency, the modern-day cooperation might not have occurred and China might not be in a position to obtain greater oil imports from Russia. After the First Five Year Plan, China did not relinquish the focus on oil due to the importance of industrialisation. The Second Five Year Plan also emphasised further improvement of the oil sector, particularly in Xinjiang. (Zhou, 1956)

A further example of how China's initial self-reliance has assisted future co-opetition is the development of nuclear energy. In fact, China's use of nuclear energy began with successful research into the development of the atomic bomb, which naturally met with great controversy internationally. Although the development of nuclear weapons derived from Mao's objective of total self-reliance and independence, in fact the existence of the atomic bomb led to future opportunities for co-opetition.

In particular, the development of nuclear weaponry in China brought about greater contact with Western nations, because it increased China's global reputation. This was, in fact, exactly what Mao wanted. He proposed developing nuclear energy to illustrate the increasing reputation of China and throw off the 'sick man of East Asia' hat. At the Enlarged Meeting of the Military Commission of the Central Committee of the Communist Party of China in 1958, Mao mentioned developing the atomic bomb to avoid being bullied and to improve China's own reputation in the world. (Mao, 1957) Although he stated that China should eschew first use in war, because the bomb would bring about large-scale damage. (Mao, 1977c) Developing nuclear energy increased the country's global prestige and directly triggered cooperation with developed countries. For example, the first developed country to establish relations with China in 1964 was France. France's president at the time, Charles de Gaulle, argued that 'a fact of considerable significance is at work and is reshaping the world: China's very deep transformation puts her in a position to have a global leading role.' (Gosset, 2009:para.1)

Further to this, early explorations of nuclear power have become increasingly important as China and the world moves away from fossil fuels in order to relieve strained energy supplies and environmental pressure. At the 2014 APEC meeting, President Xi claimed that China intends to 'achieve the peaking of CO_2 emissions around 2030 and to make best efforts to peak early and intends to increase the share of non-fossil fuels in primary energy

consumption to around 20% by 2030.' (Romm, 2015:178) In order to cope with this target, National Energy Administration Director Wu Xinxiong has stated that China aims to become a world leader in nuclear power by 2020 through industrial upgrades. In this sense, the early development of nuclear energy in order to achieve self-reliance and independence has now become a boon to China's attempts to reduce emissions and introduce green energy.

There was not a systematic plan for the development of energy until Deng's era. The systematisation, standardisation and rationalisation of energy-related issues only began to take place as the *Opening Up and Reform* gathered momentum. (Bao, 2009) Due to the new policy of economic reform, China needed to access modern technology from abroad, and also needed to cooperate with others to relieve tense relations. At this time, plans for foreign energy policy began to be developed.

The first conference focusing specifically on national energy policy took place in Hangzhou in 1979, and marked the beginning of a new stage for energy policy in China. (Bao, 2009) This meeting concluded that China's economic recovery and continued development would lead to an inevitable increased demand for energy resources, putting China's supplies into crisis. The meeting also noted that China's energy structure relied overwhelmingly on coal, and debated ways to re-address the balance. Various ways were put forward to resolve these challenges, namely conserving energy supplies and increasing the development of new energy sources. (Tu, 1980) The meeting

carried out systematic energy policy research and laid the groundwork for continued development.

In 1999, the organisation BCIM[26] was established, with the aim of promoting cooperation (including energy cooperation) amongst member countries. (Rahman, 2013) This was a sign that China was beginning to actively adopt a preference for co-opetition. Even clearer indications that China was beginning to lean toward active co-opetition in energy policy came in 2005. As Speed (2009) explains, China's energy surplus finally ran dry in 2001; meanwhile, the unstable situation in the Middle East further threatened the security of China's energy supplies. What's more, the growing pressure for emission reduction also made changes to the existing energy policy imperative. At the 19th meeting of the Standing Committee of the Tenth National People's Congress in 2005, the Vice-Prime Minister Zeng Peiyan mentioned that from the year 2003, supplies of coal, electricity and petroleum had all been reported to be reaching a state of emergency, causing the Chinese government to rapidly and seriously consider necessary changes to China's energy policy. (Zeng, 2005) Hou (2005) also mentioned that the new 11th Five Year Plan, covering the period from 2006-2010, differed from the 10th Five Year Plan (2001-2005), in that the main concern in the earlier plan had been energy supply, but the focus of the new plan was on energy efficiency and saving.

[26] A sub-regional organisation of Asian nations including Bangladesh, China, India and Myanmar, which aims for greater integration of trade and investment between the four countries.

Furthermore, the new plan aimed to combine the functions of domestic and foreign markets in order to make adjustments to energy supply.

In addition, at the 16th Party Congress in the same year, Hu Jintao took power from Jiang Zemin, and under his leadership, policies on energy began to change. President Hu stated that, in terms of energy security, the new energy strategy for China would be to maintain and protect a stable energy environment, which requires cooperation with others and respect for their differences. (Hu, 2006b) China joined various international cooperatives, such as the IEF (International Energy Forum), WEC (World Energy Council) and APEC (Asia-Pacific Economic Cooperation), as well as acting as an observer nation of the Energy Charter Treaty, maintaining a positive relationship with the IEA (International Energy Agency), and establishing bilateral dialogue mechanisms with the USA, Japan, European Union, India and other countries. (Ma, 2006a)

At the 17th Party Congress in 2007, the Chinese government proposed that China should gain new competitive advantages by actively entering into global cooperation and competition. (Xinhua News Agency, 2007a) The voices calling for adjustments to China's strategy of cooperation thus became progressively louder during the implementation of the 11th Five Year Plan. According to the white paper of the 11th Five Year Plan the key goal regarding energy was to achieve energy diversity and improve the use of coal in order to reduce emissions. (Information Office of the State Council Of the People's

Republic of China, 2006a) More generally, insisting on relationships of equal cooperation, respecting others, and finding common interests are highlighted as the key ways in which to achieve win-win policies. An example of this kind of stance was reflected in the Five Country Energy Ministers Meeting[27] in 2006. Chen (2006) points out that the total consumption of these five nations made up 42.5% of the world total in 2005; the energy ministers agreed to work on cooperating together in terms of energy conservation and efficiency, and to ensure increased transparency of data. In other words, China is working positively towards cooperation with developed countries, which could significantly benefit China's energy development. In addition, at the beginning of 2010, the establishment of a dedicated energy committee indicated the enhancement of trans-departmental integration on energy issues, representing an effective reform to meet China's current energy policy needs. (Cheng and Yu, 2013) The pressing energy issues have required China to allocate more resources to handling energy policy and research.

The 12th Five Year Plan (2011-2015) showed new developments compared to the 11th Five Year Plan. Cooperation was still the theme of the energy-related foreign policy, but with an increased emphasis on saving energy and protecting the environment, in order to bolster sustainable development. The stated key target of cooperative policies is to go out and let the advanced in. (Information Office of the State Council of the People's

[27]Energy chiefs of China, India, Japan, the Republic of Korea and the United States met in Beijing in 2006.

Republic of China, 2013a) This target calls for cooperation on the development of new clean energy and increased emission reductions to lessen the dependence on traditional energy.

In conclusion, the modification and evolution of China's energy policies over time have come about as a result of both the different preferences and guiding ideologies of its leadership and the differing domestic and international conditions throughout time. The rapid increase in energy demand as a result of the transformation of China's economic structure, the enormous international pressure to consider environmental needs, and the high requirements of integrating into the global world have all created new challenges and conditions for China's energy policy. China's energy policy has been transformed over time; it is now actively geared towards co-opetitive relations in a variety of different aspects. The following section will consider three such aspects – energy supply, energy reserves, and emissions reductions – illustrating the application of co-opetition to each in turn.

3.3 The Application of Co-opetition to Energy Policy

With the constant improvement of cooperative policies, co-opetition in China's foreign energy policy is becoming increasingly clear. Throughout Mao's *Five Principles of Peaceful Co-existence,* Deng's *Cooperative Pattern*, Jiang's *Harmony but not Sameness*, and Hu's *Peaceful Rise* and *Harmonious Society*,

it can be seen that *Hehe* has been a constant guiding principle of foreign policy for every generation of Chinese leadership. China's developmental needs require peace, and so it need not be assumed that China's rise comes as a threat. As for energy policy, China has moved from absolute self-sufficiency to co-opetition, which also reflects China's need for cooperation to allow continued development. This development can be assured in part by competition, and in part by cooperation.

China's energy security follows the global trend: supply cannot meet demand. In addition, with the country's increased global reputation and intense pressure from other states, China has to recognise aspects of Strategic Petroleum Reserve (SPR) and environmental protection. Certain energy organisations, such as the IEA, require SPR. China's objectives to be a responsible global power also requires the burden of certain responsibilities of environmental protection.

As discussed at length in Chapter Two, energy security is an important aspect of NTS, as it links the military, economic and environmental sectors together. The development of the economy is the key driver behind co-opetition in energy, but the military and the environment are also crucial, as they respectively provide insurance and shape the future direction of policy. Consequently, the Chinese government has paid significant attention to co-opetition in this field. In this section, the three aspects of energy supply,

SPR, and emissions reduction will be explored to demonstrate the exact application of co-opetition to China's energy security.

3.3.1 Co-opetition and Energy Supply

Energy supply entails many aspects, including importing energy, the transportation of energy, and the exploration and development of new or alternative energy supplies. As a result, the opportunities for co-opetition are numerous. However, the struggle to secure energy supplies inevitably draws countries into a situation of competition, creating a tense backdrop for any attempts at cooperation. For example, as Basu (2005) elaborates, the Indian Oil and Natural Gas Corporation (ONGC) overseas arm ONGC Videsh Ltd (OVL) has competed with Chinese firms for oil properties in West Africa, Central Asia and Latin America in recent years. As a result of constant competition, the effort needed to maintain cooperative links is also on the increase. Faced with this complex situation of intense competition mixed with abundant opportunities for cooperation, China is forced to adapt policies to remain up-to-date. Obviously, policies of self-sufficiency and self-reliance absolutely cannot exist anymore, and the commitment to mutual benefit and reciprocity, which have been integral elements of Chinese foreign policy over the eras, is being emphasised more than ever.

In 2003, the Chinese government published a white paper outlining issues related to energy resources which can be seen as a rudimentary form of an energy white paper. As noted in the paper, and reiterated in the 11th Five Year Plan, China's economic structure and development relies heavily on coal. With the rapid development of industry, China's current coal supply is unable to meet increasing needs. (Information Office of the State Council of the People's Republic of China, 2003) Further to this, serious pollution is being caused by the burning of coal. China therefore needs to not only increase coal mining efficiency to supply a greater demand, but also upgrade the coal purification process in order to burn cleaner coal and reduce pollution. As a result, China is actively seeking cooperation on researching and developing mineral resources. The government white paper declares that China will adopt a policy of openness towards the outside world, and, on the basis of mutual benefit, will actively participate in international cooperation in the field of mineral resources, promoting increased information, communication and technology flows in both the domestic and international market. The 11th Five Year Plan also reiterates the need for cooperation with international organisations.

These official documents illustrate that the Chinese government has identified the importance of cooperation to build mutual benefit and reciprocity, which in turn has led to further cooperation – in other words, through initial cooperative moves, a virtuous circle can be set in motion. As the paper

China's Energy Conditions and Policies of 2007 lays out (Information Office of the State Council of the People's Republic of China (2007:II), one of the objectives of China's energy strategy is cooperation for mutual benefit:

> China works sincerely and pragmatically with international energy organisations and other countries on the basis of equality, mutual benefit and win-win to improve mechanisms, expands the fields of cooperation and safeguard international energy security and stability.

However, this quotation also reflects the Chinese government's desire and sincerity to join and positively participate in the work of international organisations, helping China to become a responsible global power actively undertaking international duties.

Further to this, in order to guarantee cooperation and ensure the equality of cooperative partners, one significant element of the 11th Five Year Plan was that signs of the importance of legal protection for promoting successful cooperation are beginning to appear. According to the Information Office of the State Council of the People's Republic of China (2007:II):

> China has made active efforts to improve laws and policies related to its opening-up, promulgating in succession the Law on Sino-foreign Equity Joint Ventures, Law on Sino-foreign Cooperative Joint Ventures

and Law on Foreign Capital Enterprises to create a fair and open environment for foreign investment.

Besides this, in order to create an equal and successful environment for cooperation, it is vital to 'work together to maintain energy security. A fair and rational international energy management mechanism is a prerequisite for a stable global energy market.' (Information Office of the State Council of the People's Republic of China, 2012b:IX) In other words, protecting the stability of the global energy market means a stable energy supply for China and all other countries. The 11th Five Year Plan demonstrates that plans have been laid for the foundations of cooperation and follow-up guarantees, but what specific actions has China taken in order to achieve co-opetition in energy supply?

Firstly, in terms of enhancing the energy supply imports, China has proposed strengthening dialogues and exchanges with producing countries. According to the white paper *China's Energy Policy 2012* (Information Office of the State Council of the People's Republic of China, 2012b:IX), 'strengthening dialogue and communication among energy exporting, consuming and transiting countries is the foundation of international energy cooperation.' For instance, China National Petroleum Corporation (CNPC) and India's Oil and Natural Gas Corporation (ONGC) worked together to win a bid to acquire 37% of Petro-Canada's stake. This deal involved cooperative communication between these energy giants. However, it must be noted that China's current

participation in international energy cooperation is limited to general and interactive roles. That is to say, the degree of global energy cooperation between China and other countries is relatively low, despite China's general presence in many relevant international organisations and China's promotion of greater global cooperation. China plays an important role in the Asia-Pacific, due to its role in APEC and the Shanghai Cooperation Organisation (SCO), but conversely plays a rather sparse role in the global arena. As a result, according to the Office of National Energy Administration (2006) China should aim to deepen cooperation at the global level, including within international energy agencies, at a regional level and through the expansion of international cooperation.

Secondly, in terms of exploration of new energy supplies, the Chinese government aims to take on common responsibilities with partner countries such that both or all parties exchange technology, and define principles and agreements to guarantee the success of joint exploration:

> Carrying out effective energy cooperation. Upholding the principles of reciprocity, mutual benefit and common development, the various countries should ensure mutually beneficial cooperation in international energy resources exploration, enrich and improve cooperative mechanisms and methods, increase the international

> energy supply, and diversify supply channels. (Information Office of the State Council of the People's Republic of China, 2012b:IX)

It is important to note that according to this statement, whilst carrying out effective actions for energy cooperation, China intends to uphold the principles of reciprocity, mutual benefit and common interest, which are precisely the rules for achieving successful co-opetition as identified in the framework of game theory.

According to the Xinhua News Agency (2013a), China wishes to establish cooperation with the U.S. in aspects such as energy technology and energy risk evaluation, in order to obtain more benefit under the foundation of reciprocity and mutual benefit. Further to this, as stated in a speech at the BFA annual meeting in 2005, China is looking for external sources of energy to supplement domestic energy and will maintain the principles of reciprocity and mutual benefit to develop strategic partnerships with countries such as Australia. (Ma, 2005) But China will not only cooperate with developed countries; it has also proposed cooperation with developing countries. In the energy white paper in 2012, the Chinese government makes specific reference to the intention to 'actively provide and transfer clean and highly efficient energy technology to developing and underdeveloped countries and together promote green development globally on the condition that intellectual property rights are protected.' (Information Office of the State Council of the People's

Republic of China, 2012b:IX) Besides this, it continues to notes that, the Chinese government thus shows a responsible manner to others, appealing for the international community to strive hand in hand to help the least-developed countries eliminate energy poverty, increase energy services and promote sustainable development.

The third co-opetitive policy of energy supply is concerned with increasing energy diversity, mainly finding alternative energy to reduce over-reliance on fossil fuel. According to a joint statement given at the Five Country Energy Ministers Meeting, the five countries maintained a common interest and faced the same basic challenges and problems. (Ma, 2006a) Consequently, the five countries (China, India, Japan, South Korea, and the United States) stated that they should resolve to strengthen mutually beneficial cooperation, jointly promote and vigorously develop alternative fuel sources and improve energy efficiency, in order to reduce excessive dependence on renewable fossil fuels. The statement also endorses the strengthening of technical cooperation, as well as noting the importance of environmental protection. Importantly, a specific energy cooperation scheme was proposed at the meeting, including aspects of energy supply. Three deeper points from this statement merit closer discussion in terms of China's energy supply.

The first point is the objective to improve and enhance the supply of energy, including joint support of energy exploration with third parties not participating in the meeting. During the visit of the new Chinese president Xi

Jinping to Russia, a joint statement declared that China and Russia have agreed to build a strong relationship on energy, including oil, natural gas, coal, electricity and new energy sources. (Xinhua News Agency, 2013c) Russia will increase oil exports to China, and the top Russian crude producer Rosneft also signed a generous package of deals with China, which plans to increase oil export supply by 34 to 50 million tonnes by 2018. (Wang, 2013b)

The second key point is to popularise cooperation on alternative energy and welcome related investments. From the 1999 white paper *China's New and Renewable Energy*, the Chinese government began to pay attention to cooperation on alternative energy sources to ensure a more secure energy supply. (Information Office of the State Council of the People's Republic of China, 1999:132) Following this resolve to allow greater foreign investment in alternative power sources, China allowed the U.S. Westlinghouse Electric Co. to build four nuclear power units in China. As Chen (2006) explains, deals such as this can be seen as China offering an olive branch to foreign countries in terms of energy policy, demonstrating real ongoing cooperative efforts. In turn, Chinese firms sell finished solar cells and modules to the USA. A US-based company sold its ultracapacitors to many countries including China; Chinese wind energy companies have started to work with European and U.S. OEMs. In 2011, more than US$923 million's worth of wind energy goods and services were exchanged between China and the U.S. (Schario, 2013) In other words, competitors in the energy market have joined together to bring benefit

to one another. (Wood, 2012) China's sincere intention of cooperation over alternative energy and technology for the sake of mutual benefit is evident to see.

Thirdly, increasing joint protection of energy transportation is a co-opetitive action that the Chinese government strongly advocates to improve the security of energy supply. China's energy policy white paper of 2012, clearly elaborates that 'the international community should work collaboratively to maintain stability in oil producing and exporting countries, especially those in the Middle East, to ensure the security of international energy transport routes and avoid geopolitical conflicts that affect the world's energy supply.' (Information Office of the State Council of the People's Republic of China, 2012b;IX)

In conclusion, in order to meet demands, a major energy policy objective for China is to ensure and increase energy supply. China has enacted different policies and supervises regulation on co-opetition to protect the success of co-opetition with other countries on energy supply on the steadfast basis of establishing mutual benefit and reciprocity.

3.3.2 Co-opetition and Energy Reserves

Co-opetition in terms of China's energy reserve policy has gone from non-existent to prevalent, from single- to multi-actor, and from a single fuel

source to a variety. Although there is no specific formal white paper concerning energy reserves or conservation in China, an understanding of the importance of maintaining reserves is visible throughout other documents. According to the IEA (2012c:535), 'in order to prevent and mitigate damage caused by oil supply disruptions, China has been steadily moving forward with the building of an oil stock reserve system since 2001.' In other words, China has being paying more attention to the importance of energy reserves in recent years.

According to the Information Office of the State Information Office of the State Council Of the People's Republic of China (2001), the Chinese government first proposed the construction of a strategic petroleum reserve system in the 10th Five Year Plan, in order to protect energy security. The SPR is now an important constituent of the national energy security system; in the case of oil supply disruptions or other accidents which would affect the oil supply, tapping emergency strategic reserves can guarantee the continued stability of the national economy and development. The construction of the SPR involved drawing lessons from advanced foreign countries with greater experience; the Deputy Director of the National Development and Reform Commission (NDRC), Zhang (2009) specifically stated that China should learn from other countries' experiences. In 2003, China officially launched the base construction of SPR in four places and planned to build another eight after 2009. Once all the planned localities are finished, the SPR should be able to achieve 90-100 days standby capacity.

During the Five Country Energy Ministers Meeting, cooperation on building energy reserves was also proposed, in particular oil reserves. As Ma (2006a) points out, China's reserve system is still in the primary stages, and China requires cooperation with others in order to build an advanced oil reserve system. In an interview in 2009, Zhang Guobao, the Deputy Director of the National Development and Reform Commission, responded to the question 'why are other countries, such as the United States, raising concerns that Chinese fuel reservation will influence fluctuation in the international oil price?' Zhang stated that the proportion of China's energy in the world still remains relatively small, and trade of crude oil reaches only 6%; it is unlikely that China's reservation of oil could influence the international market. (Zhang, 2009) Both the question and Zhang's answer demonstrate the misunderstanding from other countries regarding China's energy strategy. However, as Nieh (2006:24) suggests, 'the opportunity to cooperate with other states in developing and maintaining energy security policies could permit China to improve its reputation as a positive player in international politics. Alternatively, a rigid and unilateral stockpiling regime in the spirit of 'equity oil' would decrease the fluidity of the oil market and hamper China's charm offensive on the West.' In other words, competition is constantly looming, misunderstanding is highly possible, and China still has a long way to go to maintain a successful cooperative approach.

Secondly, the SPR has gone from a single-actor to a multi-actor level. In the early stages of the SPR, the solitary actor involved has been the Chinese government. The government has been researching and exploring possibilities for the creation of reserves. As Jin (2010) analyses, China would need close to 500 mb of energy reserves to represent three months' consumption. In the current first phase, the four completed reserves bases can hold roughly 200 mb. It is expected that reserves will reach the required three month supply by 2020. Figure 5 below shows the specific development of China's SPR. The blue segment of the columns represents the first phase of establishing the reserves. The pink is the second phase and green is the third. It can be seen that the three month requirement of 500 mb is expected to be completed before the year 2020. However, the capacity for the third phase is higher than the first two phases, which took many years to build. This chart therefore demonstrates the ambitious recent development of China's energy reservation system.

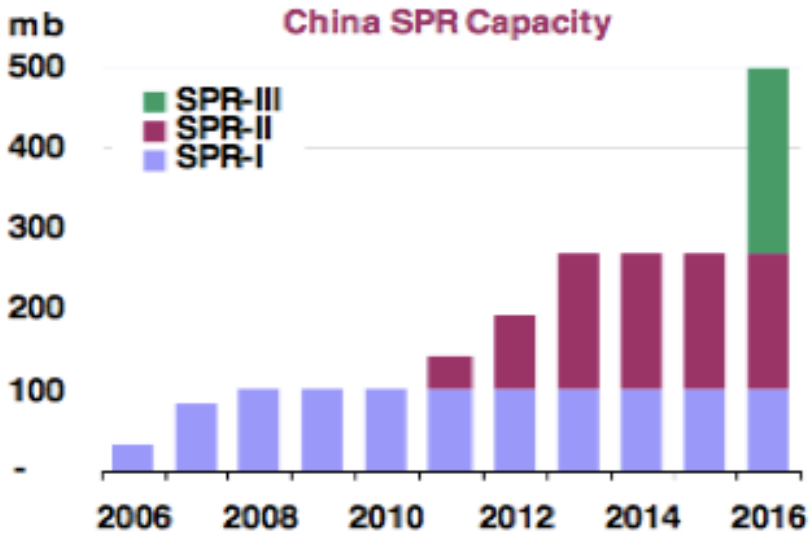

Figure 5: China's SPR Capacity from 2006 to 2016 (IEA, 2012b:9)

In the 11th Five Year Plan, the government proposed the rapid construction of government reserves, but noted too that enterprises should also establish compulsory reserves. In other words, the government has begun to encourage the development of commercial oil reserves, in order to gradually accumulate a comprehensive petroleum reserve system. (Information Office of the State Council Of the People's Republic of China, 2006a)

Thirdly, the SPR has moved from a single fuel concentration to a variety of fuel types. To begin with, China's energy reserve policies focused on oil only, but now it has become more and more diversified, including natural gas, nuclear power, new energy, and a variety of storage needs. However, as China's technological development is still not fully matured, these policies require the help and advanced experience of developed countries. As People's Daily (2011) reports , during the visit of a Chinese trade delegation to the United States in 2011, the two countries signed a number of agreements,

covering nuclear energy, wind energy, solar energy and hydropower, totalling more than US$23 billion. In addition, the United States promised to help China develop new and advanced energy through technology exchange, which will also prove beneficial for energy reservation.

Fourthly, active cooperation on energy reserves involves participation in regional and international energy reservation organisations in order to improve cooperation, reputation and trust through a multilateral approach. For instance, as Nieh (2006) illustrates, a proposal for regional joint stockpiling programs received much attention at ASEAN, ASEAN +3 and APEC meetings.

In conclusion, in order for China's SPR system to get off the ground effectively, it will inevitably require a co-opetitive approach both domestically and in terms of foreign policy. In particular, China needs to learn from the experience of other countries and also cooperate within the framework of international organisations, in order to accelerate the construction of the reserve system and shore up energy security.

3.3.3 Co-opetition and Emissions Reduction

A 2003 government white paper entitled *The Development of China's Mineral Programs*, clearly reaffirmed the need for environmentally-friendly energy policies, but did not go further than proposing treatment after pollution has already occurred. (Information Office of the State Council of the People's

Republic of China, 2003) This is telling in terms of the Chinese government's approach to environmental protection, demonstrating that the government at the time did not yet seriously recognise the importance of the clean burning of coal and reducing emissions. However, emissions reduction became a more central focus during the 11th Five Year Plan. In the white paper *China's Energy Conditions and Policies*, the government proposed that energy exploitation should be in harmony with the environment, and made a clear target for emission reduction, aiming to: 'achieve the goal of basically curbing the trend of ecological deterioration, reducing total emissions of major pollutants by 10 percent, and gain visible results in the control of greenhouse gas emissions during its 11th Five-Year Plan period.' (Information Office of the State Council of the People's Republic of China, 2007:V)

Co-opetition can mainly be applied to emissions reductions in terms of two main points, namely the exchange of advanced technology, including developing new clean energy and technology for the reduction of pollution; and co-opetition on reduction responsibilities. Firstly, regarding the exchange of technology relating to emissions reduction, the Kyoto Protocol outlined the Clean Development Mechanism (CDM) which establishes links by allowing developed countries to invest in developing countries and supply technological and financial support. Joining the Kyoto Protocol provides China with excellent opportunities for development and so signing up to optional reduction is a wise choice. As Heggelund (2007) points out, the Kyoto Protocol can provide a

good learning opportunity to teach China when and how to reduce emissions, because developed countries will be able to impart their knowledge from experience. It is therefore favourable for China to voluntarily adopt optional reduction obligations in the Kyoto Protocol for the sake of future opportunity and development.

In addition, as outlined by the Information Office of the State Council of the People's Republic of China (2011b), strengthening exchanges and cooperation with relevant international organisations and foreign governments in the field of energy conservation and environmental protection can help China to actively draw on lessons from other countries' successful experiences, in order to protect the environment and build opportunities for China. The Chinese government has therefore taken real notice of the benefit of co-opetition and mutual cooperation. According to the *Work Plan for Greenhouse Gas Emission Control during the 12th Five-Year Plan Period*, China will strengthen the continued construction of international exchange and dialogue in the field of emissions reduction, and actively carry out multi-channel project cooperation, as well as conducting pragmatic cooperation in scientific research, technological development and capacity building, and actively introducing, digesting and absorbing advanced foreign technology and successful international experience. (Information Office of the State Council of the People's Republic of China, 2011d) In turn, this paper also mentions that China should work to actively support African countries, small

island states and other less well-off countries, thus further reinforcing the response to emissions reduction needs and implementing *introduce* and *go global* policies*,* by promoting low-carbon cooperation with other developing countries. Further to the Copenhagen Summit, according to the Information Office of the State Information Office of the State Council of the People's Republic of China (2011c:V):

> In 2010, China took an active part in the negotiations and consultations at the Cancun Conference, adhered to the principles of maintaining openness and transparency, extensive participation and consensus through consultations, proposed constructive plans on various issues and made important contributions to help the conference achieve practical results and put the talks back on track.

In sum, it can be seen that China has been working to show a spirit of determination for cooperation over the issue of emissions reduction, including actively participating in related multilateral summits and making efforts to meet reduction demands ahead of the compulsory schedule.

3.4 Conclusion

This chapter has mainly introduced the ways in which co-opetitive approaches have been applied over time to the major approaches of China's foreign policy as well as to energy policy in particular, and has introduced three elements of China's energy policy where co-opetitive policies can be seen in practice.

Abundant approaches are proposed to handle issues of energy security, but this thesis looks specifically at foreign policy-related approaches. As such, this chapter firstly discussed the guiding ideologies of foreign policy within modern China's different generations of leadership, explaining how a co-opetitive approach and China's traditional *Hehe* culture, which aim to uphold unity, peace, and harmony, have been an unwavering theme of Chinese foreign policy ever since the founding of the PRC. *Hehe* culture can be seen as a theoretical predecessor to the concept of co-opetition; the guidance of *Hehe* culture means that Chinese foreign policy has entailed aspects of co-opetition, whether implicitly or explicitly, throughout the different leadership eras. Thus, China's foreign policy – from the era of Mao Zedong to the era of Hu Jintao – has always shown a preference for a peaceful rise and for harmonious development, although these have only become explicitly stated aims in recent years.

In terms of China's energy-related foreign policy, in the era of Mao Zedong, China pursued a stance of self-reliance, although this was largely influenced by the political circumstances of the time. In fact, China's long-term

self-sufficiency and plentiful resources meant that self-reliance was a viable option under the domestic and international circumstances during Mao's era. However, after *Opening Up and Reform*, the rapid and massive economic development increased energy consumption levels to the point that domestic supply could no longer meet demand, and China had no choice but to *introduce* and *go global*. The non-stop development of China has brought about a raft of new challenges which require China to cooperate with developed countries and absorb advanced foreign technology in order to construct a *Green China* – a China which conserves energy and protects its environment.

However, due to the finite and unequal distribution of energy, competition to secure energy reserves is continually increasing. It is admittedly difficult to seek cooperation under such conditions. Nevertheless, the Chinese government still promulgates a series of policies to intensify cooperation, including the formulation of corresponding laws and regulations. It could even be said that the tense environment of energy competition has created a situation in which efforts to cooperate must be codified and more carefully considered for feasibility and practicality, which may be overlooked without the pressure of competition.

This chapter also illustrates the application of co-opetition to China's energy supply, energy reserves and emissions reduction policies. China's efforts to apply co-opetition to energy policy aim to bring about mutual benefits

for China and its partners, make up shortfalls in energy supplies and technological experience and know-how, and adhere to the principle of international cooperation in order to constantly deepen and strengthen a positive co-opetitive stance. However, due to differing circumstances and conditions, co-opetition between China and other countries or regions has achieved different degrees of progress. The following three chapters will discuss in turn the specific application of co-opetition to China's energy relations with Japan, Russia, and Africa.

Chapter Four: A Case Study of Sino-Japanese Co-opetition on Energy

As discussed in Chapter Three, co-opetition has played an important role in China's energy policy since the beginning of New China, with elements of co-opetition running through the various eras of leadership. Although attempts at cooperation were relatively weak in Mao's era, this did not mean that the Chinese government had abandoned a commitment to co-opetition. The *Five Principles of Peaceful Coexistence* gave China the impetus to cooperate, and indeed a certain degree of cooperation did exist between China and African countries. However, during this period, cooperation with the rest of the world was extremely limited, largely due to Mao Zedong's interpretation of the international and domestic *zeitgeist*. However, with origins in traditional Chinese *Hehe* culture, China's commitment to peaceful coexistence and cooperation has never wavered, and in successive post-Mao leaderships, greater efforts have been dedicated to achieving these objectives in foreign policy. China's foreign policy and energy policy are closely related, and following the trends in foreign policy, energy policy likewise transitioned from self-sufficiency to co-opetition.

Chinese energy policy has been influenced both by these foreign policy trends, and by the philosophy of *Hehe* culture, with an ever-increasing effort towards co-opetition. Energy is also a significant aspect of NTS due to its

important connection to the military, economy and environment, and this significance has caused energy to be one of the major arenas of interdependence and cooperation between states in the 21st century. And yet, Sino-Japanese energy relations appear to be bucking these trends.

Although energy could represent a key area for cooperation to improve Sino-Japanese relations, it has instead become a sticking point between the two countries. The Chinese government ostensibly centres its analyses of Sino-Japanese energy cooperation on Chinese national policy, in order to best foster successful bilateral cooperation with Japan and establish multilateral channels of communication. However, although Deng Xiaoping set in motion the idea of setting aside territorial disputes in order to focus on joint development, the conflict over the Diaoyu/Senkaku Islands has become a major point of contention. The Chinese government claims that in 2012 the Japanese asserted undisguised nationalism in its claims over the islands (Information Office of the State Council of the People's Republic of China, 2012a), and this has cast a shadow over the two countries' mutual relations, and thereby, over their potential for co-opetition on energy.

As China has long been an energy-exporting country, scant attention had previously been paid to energy relations with Japan, and there is still little profound analysis. Some studies, such as Li (2005), offer an overview of the historical developments in Sino-Japanese relations, summing up the background of shared energy cooperation. However, research such as this

fails to draw the larger picture and pinpoint the intentions behind the development of cooperation. In this chapter, the framework of game theory will help to identify the motivations behind co-opetition on Sino-Japanese energy.

Some analysts, such as Townsend and King (2007), have taken a sceptical attitude towards Sino-Japanese energy cooperation, believing that China will harness its geopolitical advantages in Central Asia rather than attempt to build a close co-opetitive relationship with Japan. China has a strong political influence in Central Asia and may be able to secure and even monopolise the area's oil and gas resources. For their part, many Japanese scholars, including Yoshimatsu (2011), believe that China lacks the capacity to take a leading role in establishing multilateral energy mechanisms, as China is yet to achieve real success in spurring regional energy cooperation. The current best potential for multilateral energy cooperation including both China and Japan seems to lie in ASEAN+3 and the East Asian Regional Energy Community, where Japan takes a leading role. This chapter will argue that China can show itself to be an important actor in multilateral energy cooperation through the conditions of mutual benefit and peaceful coexistence as espoused by traditional *Hehe* culture.

According to existing research, the Sino-Japanese energy relationship is characterised far more by competition than cooperation. China and Japan's thorny historical relationship, and their current insatiable thirst for energy add to the complexity of Sino-Japanese co-opetition. What is more, the

two countries are located in the same geographical area, fighting over the same sources of energy procurement. In spite of this tense competition, it cannot be said that there is no possibility whatsoever for greater cooperation. In particular, resolving territorial controversy in the East China Sea would represent an important step on the road to building a closer relationship in the future. But what would this mean for energy relations? Can co-opetition ever really exist in Sino-Japanese energy relations? Or will it be a zero sum game through and through?

This chapter will divide analysis of Sino-Japanese energy co-opetition into two sections. Firstly, the background of Sino-Japanese co-opetition will be analysed in greater detail, including Japan's energy challenges and current and historical Sino-Japanese energy co-opetition. Historical relations will be discussed because *Hehe* culture was not shaped in one day but instead developed historically through Chinese philosophy. It is reflected in different eras and in leaders' thoughts and strategies. As a result, the insights from Chapter Three regarding the differing approaches of successive Chinese leadership will also be important in this section, as these background considerations can shed light on the decisions of the Chinese government and help determine whether the two nations' energy relations can only be seen as a *zero-sum* game. This section will also interject previous and ongoing projects and summits, as well as current discourse, into the discussion of

Sino-Japanese energy relations in order to better understand the progress of co-opetition.

The second section will analyse Sino-Japanese energy co-opetition according to the PARTS model of game theory, through different actions on energy exploration, supply, reservation and environment protection; the four aspects which represent the primary threats to China's energy security.

4.1 Sino-Japanese Energy Co-opetition: A *Zero-Sum* Game?

In recent years, Russian oil pipelines to the East China Sea oil fields have fuelled a growing trend in energy importing and consumption in Asian countries, leading to increasingly tense competition between energy-hungry nations including China and Japan. In addition, territorial disputes in the East China Sea have reached fever pitch, and this seems to be rapidly transforming Sino-Japanese relations into a pure *zero-sum* game. Although the Sino-Japanese fight for energy is a normal manifestation of energy market competition, China and Japan are regional neighbours using the same suppliers and both burdened with significant energy requirements. If there is any significant or even minor disruption to the market balance, the foreign relations between the two countries are likely to suffer greatly as a result. In order to avoid this outcome, China and Japan have a common responsibility to

engage in cooperation rather than intensifying competition, thereby ensuring a stable supply of energy for both countries. Analysing and addressing the underlying roots of China and Japan's testy relationship may be of assistance in attempts to establish greater cooperation. The first aspect to consider is the background of Japan's energy conditions.

4.1.1 Japan's Energy Conditions

The current state of Japan's energy conditions is decidedly pessimistic. As of 2012, proven oil reserves in the Asia-Pacific area comprised only 2.5% of global proven reserves. Reserves in Australia, Brunei, China, India, Indonesia, Malaysia, Thailand and Vietnam make up 2.4%, with all remaining Asia-Pacific countries – including Japan – accounting for a mere 0.1% of the world's total. (BP, 2013b) However, as shown in Figure 6 of the structure of Japan's energy supply, oil represents the largest majority of total Japanese primary energy supply. Japan thus inevitably relies on imports to meet this demand for oil. In fact, Japan does not import only oil, but needs to import other fossil fuels. As it stands, Japan is currently the world's leading importer of liquefied natural gas, the second largest importer of coal, and the third largest net oil importer. (U.S. Energy Information Administration, 2013a) Due to a decline in available local resources, Japan is left only with the option to accelerate efforts of energy diversification and exploration of renewable resources to resolve its energy dilemma.

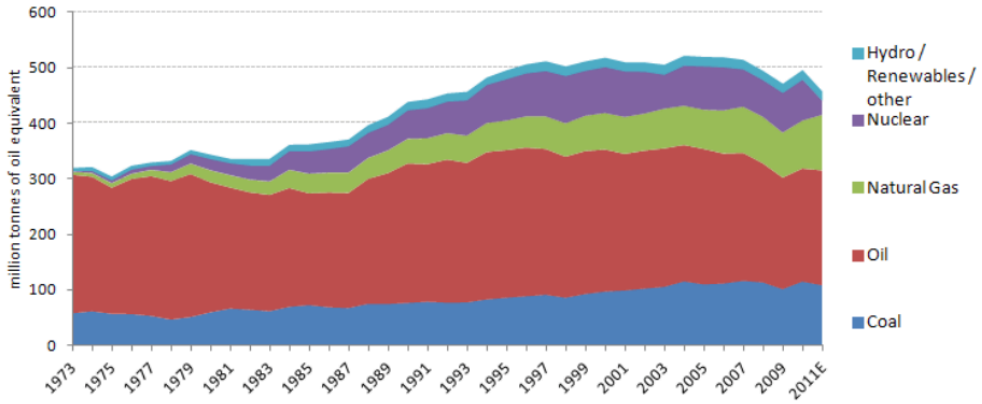

Figure 6: Japan's Total Primary Energy Supply from 1973 to 2011 (IEA, 2013a:4)

As Figure 6 shows, there was a dip in the use of primary energy in 2009. According to a report from the Japanese Statistics Bureau, the decrease in total energy consumption was mainly caused by a serious economic downturn in 2009. (Statistics Bureau of Ministry of Internal Affairs and Communications, 2014) This reveals how closely energy is related to the economy. Since 2009, the use of energy has picked up again, though the increase in oil use has been relatively slow, whereas renewable energy usage increased fairly steeply. This reflects the Japanese government's focus on alternative energy and independent research and development (R&D). (Ministry of Economy Trade and Industry of Japan, 2006) These trends may afford greater opportunities for Sino-Japanese cooperation on renewable energy.

In addition, Figure 6 reveals the steep drop in use of nuclear energy from 2011, triggered by the Fukushima incident of March 2011[28]. According to a BP report, nuclear energy in the Asia-Pacific area made up 13.9% of the world total, but Japan accounted for only 0.7% in 2012. (BP, 2013b) This figure dropped dramatically by 89% from 2011 to 2012. According to a report by the U.S. Energy Information Administration (2013a), before the 2011 earthquake and tsunami leading to the Fukushima disaster, Japan was the third largest consumer of nuclear power in the world market, with nuclear power accounting for 13% of total energy consumption in Japan, but after the earthquake, this fell to 7%. The accident at Fukushima has sharply raised the Japanese government's awareness of the importance of energy diversification, and with concerns regarding the safety of nuclear power, the proportion of oil and natural gas consumed increased. Oil had always remained Japan's primary energy source, at 43% of the total in 2011, but this had dropped from 80% in 1970. After the Fukushima incident, oil consumption began to rebound. (U.S. Energy Information Administration, 2013a)

[28] 'March 2011, a 9.0 magnitude earthquake struck off the coast of Sendai, Japan, triggering a large tsunami. The earthquake and ensuing damage resulted in an immediate shutdown of about 10 GW of nuclear electric generating capacity. Between the 2011 Fukushima disaster and May 2012, Japan lost all of its nuclear capacity as a result of scheduled maintenance and lack of government approvals to return to operation. Two nuclear reactors were re-commissioned in July 2012 and represented the only source of nuclear power in the country for more than one year. However, these two reactors were removed from service again in September 2013, eliminating the country's nuclear capacity for a second time in more than 40 years.' (U.S. Energy Information Administration, 2013a)

The disaster at Fukushima pushed Japan towards greater efforts at exploring renewable energy alternatives as well as increasing imports of oil and natural gas. As Watanabe and Suga (2014) mention, the Japanese Prime Minister Shinzo Abe is keen to promote the low carbon industry not only in the domestic market, but also abroad, in order to assist Japan's transition to greater renewable energy usage. Nevertheless, after the Fukushima disaster, the import of oil and natural gas began to increase once more in 2012, to provide direct fuel for burning in power plants to replace the nuclear plants. (Dunn and Eshbaugh, 2013) Will this trend add to the intensity of Sino-Japanese energy competition in overseas markets?

4.1.2 The Historical Development of Sino-Japanese Energy Co-opetition

The preceding section outlines the rather grim state of Japan's current domestic energy conditions. In terms of energy relations with China, the biggest difficulty is the historical flux of the relationship, which continues to influence progress today. Sino-Japanese energy relations can be divided into five key stages, namely the period of Japanese imperialist plunder of Chinese energy resources (1894-1945); the period of Sino-Japanese *cooperation without action* in Mao's era (1945-1972); the Sino-Japanese cooperation under

mutual benefit in Deng's era (1973-1993); and the period of co-opetition in the energy game under Jiang (1993-2003) and Hu (2003-2013).

In the period of the Japanese imperialist plunder of Chinese energy, there was no subtle interplay of competition and cooperation. Rather, from 1894 to 1945, the Chinese were subjected to the imperialist ambitions of the powerful Japanese, as Japan sought materials and energy from its resource-rich but weakened neighbour to support its own national development. After the Meiji Restoration in 1868, Japan's strength enhanced significantly (Gluck, 1997), and Japan's expansionist strategy led it to seek resources in China. Japan was able to invade China with little resistance, as China had been weakened by the domestic and international failures of the Qing dynasty regime. (Ni and Van, 2005) The Sino-Japanese War of 1894-1895 marked the beginning of this difficult period; in the following 50 years, Japan was able to extract a great deal of resources from China. For instance, from the Fushun Colliery alone, 227 million tonnes of coal were transported to Japan. (Wang, 1995) In short, during this stage of Sino-Japanese energy relations, there was not even a modicum of competition, let alone cooperation.

However, from 1945 onwards, after Japan surrendered in the Second World War, the situation completely changed. From 1945 to 1949, China was engaged in civil war between the Chinese Communist Party and the Chinese Nationalist Party. Foreign relations with other countries were almost

universally neglected during this time. The period following the Communist victory in 1949 until 1978 was the era of Mao Zedong. Although Mao proposed the *Five Principles of Peaceful Coexistence*, cooperation with Japan was not formal and diplomatic relations had not been established, showing that their acrimonious history still continued to cast a dark shadow over Sino-Japanese relations. The Chinese leadership refused to overlook the issue of Japanese war guilt. (Ferguson, 2008) Yet Sino-Japanese cooperation during this era was not as strained as some may think. Rather, cooperation instead followed the principle that Mao proclaimed in the 1950s: 民间先行，以民促官 – *people take the lead and the government are led by the people.* (Geng, 2010:64) In other words, cooperative efforts were mostly not yet at an official level, and most cooperative efforts were non-governmental until late in Mao's era. For instance, from the 1950s, China and Japan signed non-governmental energy cooperation treaties. However, due to the embargos set against Japan as a consequence of the Second World War, there was little realistic scope for cooperation at this time. (Du, 2005; Burns, 2000) Nonetheless, despite the circumstances and the difficult history shared by the two countries, China still held on to the wish for peaceful coexistence espoused in *Hehe* culture, and non-official cooperation continued throughout this period.

The third period was from 1972 to 1993. The successful cooperation during this period benefitted from the *Five Principles of Peaceful Coexistence* and especially from Deng Xiaoping's policy of constructing cooperative

relations. In 1972, China and Japan signed a joint communiqué to formally re-establish diplomatic relations, a move which also signified the beginning of formal Sino-Japanese energy cooperation. The communiqué reads:

> The Government of Japan and the Government of the People's Republic of China agree to establish relations of perpetual peace and friendship between the two countries on the basis of the principles of mutual respect for sovereignty and territorial integrity, mutual non-aggression, non-interference in each other's internal affairs, equality and mutual benefit and peaceful co-existence.(Ministry of Foreign Affairs of Japan, 1972:para.12)

This statement demonstrates that Sino-Japanese cooperation was based on the tenets outlined in the *Five Principles of Peaceful Coexistence* and also sealed the existence of *Hehe* culture. From this point onwards, official cooperation began to shows signs of progress. The Japanese government began to focus on the necessity of energy source diversification after the first Middle Eastern oil crisis in 1973. At the time, China's energy production was increasing year on year (Suzuki, 2000), and as a result the proportion of oil Japan imported from China soared from 4.3% in 1973 to 41.3% in 1976, a nearly tenfold increase. (Tian, 2002) Tian (2002) continually points out, the Daqing oilfield was responsible for most of the oil output to Japan. The Bank of

Japan supplied three batches of energy loans to China from 1979 to 1993, making up a total value of 1.7 trillion yen.

In addition to financial aid, Japan also supplied the technology and equipment to assist China's exploration projects. As Emmers (2009) explains, Chinese crude oil was exported to Japan in exchange for advanced technologies. For instance, the Japanese Chiyoda Corporation provided a series of equipment, which could supply 400 million cubic metres of oil a day. (Tian, 2002) These projects helped to strengthen bilateral cooperation and also went some way to solving both China and Japan's urgent energy requirements. China was in need of technology and capital to spur development, whilst Japan needed diversified sources of energy to reduce reliance on the Middle East and meet increasing demand. Cooperation during this period was therefore mutually beneficial as Japan's financial support helped resolve funding issues for the development of Chinese energy resources, whereas China's energy exports helped relieve the pressure of Japan's growing energy shortage. This evidence supports assumption two [29]and indicates that the interdependence between China and Japan focuses not only on technology, but also on the economy.

In the era of Deng Xiaoping, Sino-Japanese energy cooperation continued to flourish due to Deng's cooperative pattern policy. Sino-Japanese combined energy output and financial support and there was increasing

[29] Assumption Two: The interdependence in co-opetition not only comes from military, but also other aspects.(Details have been examined in section 2.1.3)

interest in cooperation on energy on both sides. The two countries attempted to organise conferences and bilateral negotiation mechanisms to continue promoting successful cooperation. In October 1978, Deng Xiaoping signed the *Sino-Japanese Peace Treaty*[30] with the then Japanese Prime Minister Fukuda Takeo. (Wang, 2000) In addition, Deng Xiaoping also proposed the shelving disputes and carrying out development in the treaty. That is to say, from Deng Xiaoping's perspective, joint development was a wise approach because it would be far too difficult to resolve long-term controversies between nations, particularly at a time when China was struggling with internal development.

> It is true that the two sides maintain different views on this question... It does not matter if this question is shelved for some time, say, ten years. Our generation is not wise enough to find common language on this question. Our next generation will certainly be wiser. They will certainly find a solution acceptable to all. (Deng, 1989:171)

In other words, even if there were outstanding territorial disputes which were yet to reach resolution, Deng believed it to be more advantageous to shelve disputes for the short-term and engage in joint developmental projects instead. Joint development would also lead to increased mutual understanding and respect, and therefore help oil the wheels of efforts to resolve territorial and sovereignty disputes. (Ministry of Foreign Affairs of the People's Republic of

[30]The full name of the treaty is *Treaty of Peace and Friendship between Japan and the People's Republic of China.*

China, 2014e)

The Joint Communiqué of 1972 clearly pointed out that both sides should respect sovereignty and territorial integrity. The Chinese government claims that Japan has failed to honour this agreement by claiming sovereignty over the Diaoyu/Senkaku Islands, and cites the Potsdam Declaration of 1945. Principle 8 of the declaration stated: 'the terms of the Cairo Declaration shall be carried out and Japanese sovereignty shall be limited to the islands of Honshu, Hokkaido, Kyushu, Shikoku, and such minor islands as we determine.' (Ministry of Foreign Affairs of Japan, 1966) The Chinese government points out that the Japanese government promised to obey the Potsdam Declaration in the Joint Communiqué, and that the declaration does not include the Diaoyu/Senkaku Islands. In 1992, China officially asserted its claim by passing the *Law on the Territorial Sea and Contiguous Zone*, which explicitly specifies that the islands are China's territory. The Japanese government uses a different understanding of international law, including the continuity of the continental shelf to lay claim to the islands. (Pan, 2007) The beginning of tension over the Diaoyu/Senkaku Islands can shed some light on why joint cooperation, particularly direct energy importing and exporting, was initially successful but progress has since stalled, especially in terms of joint exploration. Does this demonstrate that long-term energy cooperation needs to be established on the basis of mutual political trust? Certainly, it seems that it is difficult for bilateral treaties to be kept without international supervision. All

the discussions referred to above support both assumption three[31] and four[32]. That is to say, building trust between China and Japan is difficult and it is difficult to divide the pie (interest) in the co-opetition.

Furthermore, it would appear that cooperative relations run the risk of becoming brittle if based on economic interests alone, without other common interests or shared objectives. As Guo (2008) argues, energy cooperation between China and Japan is driven almost entirely by economic interests; this kind of cooperation is particularly vulnerable and may be easily destroyed when conditions change. Tretiak (1978) also claims that the aim of budding Sino-Japanese cooperation was mostly not for political purposes per se, but rather for the sake of long-term bilateral trade. (particularly between 1978 and 1985)

Indeed, the situation did change in 1993 and cooperative efforts were quickly replaced with competition. By this time, China's energy structure had changed; China became a net energy importer in 1993 and was unable to continue exports to Japan. The fourth period of Sino-Japanese energy cooperation, during the era of Jiang Zemin, began at this point and lasted until 2003. Under Jiang, the focus of co-opetition was *harmony but not sameness*, and based on this policy, the Chinese government made moves to accept differences with the Japanese government and achieve cooperative common

[31] Assumption Three: Building trust in co-opetition is much more difficult due to the existence of interdependence. (Details have been examined in section 2.1.3)

[32] Assumption Four: Dividing the interest is difficult due to the interdependence (Details have been examined in section 2.1.3)

development. In 1998, Jiang visited Japan, and the two governments signed the *Japan-China Joint Declaration on Building a Partnership of Friendship and Cooperation for Peace and Development.* (Ministry of Foreign Affairs of Japan, 1998a) Some scholars such as Sato (2001) believe that the declaration was a last-ditch attempt, and that the true intention behind the signing of the joint declaration was the Chinese leadership's desire to establish some measures to stop the downward trend of Sino-Japanese relations.

Nevertheless, there are three points of note in the declaration. Firstly, with deeper interdependence, the *Five Principles of Ppeaceful Coexistence* remained crucial: 'both sides reaffirmed the principles of mutual respect for sovereignty and territorial integrity, mutual non-aggression, non-interference in each other's internal affairs, equality and mutual benefit and peaceful co-existence.' (Ministry of Foreign Affairs of Japan, 1998a:I)

Secondly, the emergence of cooperative organisations brought a new perspective to Sino-Japanese co-opetition. As stated in the declaration, 'both sides believe that stable relations amongst the major nations of the Asia-Pacific region are extremely important for the peace and stability of this region. Both sides shared the view that they would actively participate in all multilateral activities in this region, such as the ASEAN Regional Forum, promote coordination and cooperation, and support all measures for enhancing understanding and strengthening confidence.' (Ministry of Foreign Affairs of Japan (1998a:II)

Thirdly, in the Joint Press announcement of the Joint Declaration, energy was especially mentioned: 'Both sides… shared the view that they will further promote cooperation in such areas as the promotion of energy related infrastructure development including power plants, the energy conservation policy and measures, and the development and use of clean energy…' (Ministry of Foreign Affairs of Japan, 1998b:I) This shows that Sino-Japanese energy cooperation has reached a turning point towards energy reservation and the development of clean alternative energies. However, long-term cooperation seems to still be limited to Japanese aid and development rather than joint cooperation to handle issues of supply, such as competition over the Russian energy market. Thus, all the complicated co-opetition between China and Japan illustrates that interdependence on economy is much more stable than it is on other aspects, such as technology.

Then, in the era of Jiang, pure energy cooperation between China and Japan for the purpose of economic development ended, but within the vision of peaceful coexistence, mutual benefit and common development, Sino-Japanese cooperation on energy turned in a new direction, towards exploration of new energy and energy storage.

The final stage has been since 2003. During this period, Sino-Japanese energy cooperation has been increased and upgraded. A series of multilateral energy cooperation projects have been commenced. For example, beginning in 2003, China and Japan signed a series of documents

concerning multilateral energy cooperation such as the Joint Declaration on the Promotion of Tripartite Cooperation between Japan, the People's Republic of China and the Republic of Korea, signed within the auspices of ASEAN+3, in which it was proposed that in terms of cooperation in energy, 'The three countries will expand their mutually beneficial cooperation in the field of energy and work together to strengthen regional and global energy security.' (Ministry of Foreign Affairs of Japan, 2003:III)

The important point here is that these three countries have recognised the importance of regional energy security. Any changes in relations between the three countries will influence regional or even global energy security. In a second trilateral summit meeting in 2009, the three countries' joint declaration states that they will: 'work closely together and spearhead cooperative efforts in international frameworks for energy cooperation, aiming to promote sustainable development through deployment of clean energy and improvement of energy efficiency.' (Ministry of Foreign Affairs of the People's Republic of China, 2009:para.11) It is clear that the focus here is still on new alternative energy and energy saving. Then, in the third trilateral summit meeting, which took place in 2010, the countries continued to address cooperation on energy, particularly energy efficiency (Ministry of Foreign Affairs of Japan, 2010), and at a later fifth summit, the three parties once again faithfully discussed cooperation on renewable energy, concluding that they had reached energy-saving achievements proposed in

their second summit, and mentioning that they have supported ‘six programs in two phases, covering areas from sewage treatment, new materials and disaster prevention to climate change and energy-saving technologies.’ (Ministry of Foreign Affairs of Japan, 2012:IV)

In addition, the Association of Southeast Asian Nations (2004:para.57) reports that in 2004, in the ASEAN+3 energy ministers ‘meeting, proposals were made to emphasise strengthening energy cooperation between member states. The *Qingdao Initiative*, a declaration to strengthen energy cooperation, was released in the third Asian Cooperation Dialogue (ACD) Foreign Ministers’ Meeting of 2004. (Hu, 2004b) In this initiative, the first official documents between China and Japan regarding the maintenance of energy security through balancing supply and demand were signed. The initiative especially emphasises the importance of the Asian energy market, and outlines that energy security should be achieved not only through candid dialogue and pursuit of mutual benefits, but also as an important aspect of regional and global cooperation. (Ministry of Foreign Affairs of Japan, 2004)

In 2007, during the first Sino-Japanese Ministerial Energy Cooperation Dialogue, China and Japan signed the *Joint Declaration on Strengthening Bilateral Cooperation of Energy Departments*. Both sides stated the importance of enhancing cooperation on energy-saving measures and alternative and renewable energy, based on the principle of mutual benefit. Further to this, the Cebu Declaration on East Asian Energy Security from the

Second East Asia summit re-asserts the importance of energy efficiency and renewable energy, and especially highlights the importance of collective commitment to ensure energy security at the regional level. (Ministry of Foreign Affairs of Japan, 2007) The *Singapore Declaration on Climate Change, Energy and the Environment from the Third Summit* aims to develop clean energy to reduce emissions, and improve energy efficiency in order to reduce the intensification of energy usage. (Office of Ministry of Foreign Affairs of the People's Republic of China, 2007) A few years later, the Fukui Declaration on Low Carbon Paths to Energy Security: *Cooperative Energy Solutions for A Sustainable Asia-Pacific Economic Cooperation* was published at the ninth meeting of APEC Energy Ministers in 2010, a meeting in which the APEC members discussed the development of energy security in the Asia-Pacific area.

Encouragingly, these cooperative measures have continued up to the present day. According to the National Energy Administration of the People's Republic of China (2014b) the latest energy ministry meeting of APEC in 2014 discussed the establishment of a new energy security system, which would advocate an open, inclusive, cooperative and sustainable Asia-Pacific energy security concept through enhancing the synthesised exploration of crude oil and natural gas as well as cooperating on new renewable energy. This kind of flexible, inclusive cooperation allows for different conditions in different APEC countries, and thus matches the Chinese traditional concept of harmony

despite differences. Only by admitting and working around differences can states achieve long-term peaceful cooperation and co-existence.

It can be found that Sino-Japanese cooperation mostly fits the framework of multilateral dialogue and organisations, rather than real bilateral cooperation, with the sole exception of the Sino-Japanese Ministerial Energy Cooperation Dialogue. Over time, the Chinese perspective has been a willingness to cooperate with Japan under the tenets of the *Five Principles of Peaceful Coexistence* in Mao's era through to Hu's *harmonious society* and *peaceful rise*. *Hehe* culture has never been abandoned during this time, despite certain rocky stages in the history of the two countries' cooperation. This supports assumption one[33] and shows that international organisation between two players can push co-opetition, but still cannot replace the role of countries.

However, it seems that one fundamental flaw in bilateral cooperation between Japan and China is that efforts have been based on economic cooperation rather than the construction of shared interests and common viewpoints. In particular, the two countries' disputes over sovereignty are hindering energy cooperation, but it may be that the two countries would struggle to find a different, more workable model of co-opetition than one based on the economy. The following section will use the model of PARTS to

[33]Assumption One: International Organisations play an important role due to the interdependence in co-opetition, but it still cannot replace the function of states. (Details have been examined in section 2.1.3)

analyse the concrete conditions of co-opetition in different aspects of Sino-Japanese energy cooperation.

4.2 Sino-Japanese Energy Co-Opetition under the Model of Game Theory

4.2.1 Players: Two Fair Symmetrical Opponents

Two approaches relating to the players in the Sino-Japanese energy game will be analysed. The first approach is to discuss players from the angle of power and resources. In this regard, and in terms of energy, China and Japan are symmetrical powers. As stated in Chapter Two, it is easier for cooperation to be achieved between asymmetrical powers. So what is the effect of this power symmetry on Sino-Japanese energy co-opetition?

In order to answer this question, the energy symmetry of these two players needs to be investigated more thoroughly; this will demonstrate that the symmetry dictates an intense competition between the two powers and hinders cooperation. Three factors define the symmetry: the similarity of the two countries' growth in energy demand, the similarity of suppliers and energy type demands, and the similarity of energy development strategies. The similarity of the two countries' growth in energy demand is the first factor defining the symmetry in power. According to BP (2013b), the primary energy consumption in Asia represents 40% of the world total, with China accounting

for 21.9% and Japan 3.8%. Although, China uses a far larger proportion than Japan, when taking into account the population of China, the symmetry between Japan and China is still apparent. China's imports of crude oil reached 239 million tonnes in 2010, with a value of 134.936 billion U.S. dollars. (Matsumoto, 2012) Meanwhile, Japan needs to import up to 99% of its oil and 95% of natural gas. (West, 2014) According to the U.S. Energy Information Administration (2013a), oil is the most significant energy resource in Japan, making up 45% of total domestic energy consumption. Therefore both China and Japan are heavily reliant on oil imports and both are concerned that the other is a potential rival in the struggle to secure supplies. The Institute of Energy Economics (2004) argues that Japan's future global energy strategy will be determined in large part by the growth of China's energy consumption and demand. In other words, both China and Japan are experiencing increasing energy demand and need to find supplies elsewhere, leading to direct competition.

The second factor of energy symmetry is that China and Japan share similar principal suppliers and energy type demands. In particular, as mentioned previously, both rely heavily on foreign supplies of oil. In 2004, 40% of China's oil and 97.9% of Japan's oil was imported from abroad. (Snow, 2005) By 2012, China's total had risen to 53.8%, with an average 2.8 percentage point increase each year. (National Bureau of Statistics of the

People's Republic of China, 2012) In addition, both China and Japan have found a similar profile of suppliers in the world market.

Figure 7 represents the make-up of Japan's oil import source countries in 2012, and clearly shows that Japan mainly relies on the Middle East for oil, making up 79% of total imports. Russia is the second energy supplier, followed by Iran. The rest of the world, including Africa, only accounts for 17% of the total. This indicates the potential opportunities for Japan to cooperate with Africa to increase supplier diversity.

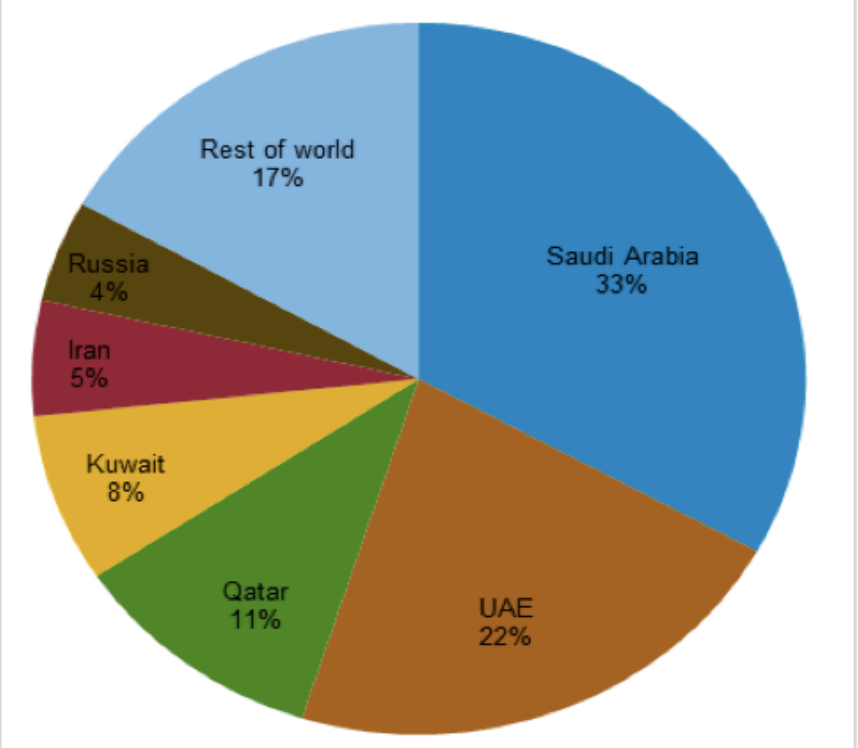

Figure 7: Japan's Crude Oil Imports by Source in 2012 (U.S. Energy Information Administration, 2013a:6)

Figure 8 is the equivalent pie chart for China in 2013. It can be seen that the major direction of imports is similar. Both countries rely on the Middle East, though the proportion of Japan's reliance is greater. Japan's urgency to reduce dependence on the Middle East is therefore greater than China's. The second similarity is that both countries are looking to make energy deals with Russia. The largest difference between the two countries is the different suppliers outside of the Middle East and Russia, especially China's growing dependence on Africa, which stood at 18% of total imports in 2013. Africa may prove a beneficial direction for China's energy development in the future. (U.S. Energy Information Administration, 2013b) However, as Japan is also now actively pursuing cooperation with Africa, this undoubtedly increases competition between China and Japan.

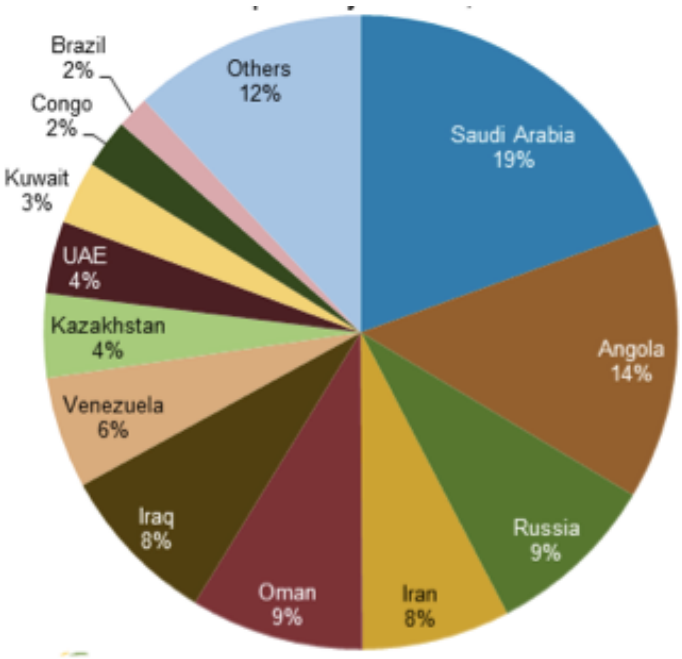

Figure 8: China's Crude Oil Imports by Source in 2013 (U.S. Energy Information Administration, 2013b:11)

Finally, the third factor of energy symmetry is that both China and Japan have comparable energy development strategies. Both wish to achieve the goals of diversification and clean energy development in order to strengthen environmental protection. (METI, 2010; Information Office of the State Council of the People's Republic of China, 2012b) In China's case, pressure has been growing due to increasing consumption rates; for example, in the Eleventh Five-Year period from 2006 to 2010, consumption of crude oil rose by an average annual growth rate of 8%, 1.7 percentage points higher than the planned average growth. The consumption of natural gas has also been increasing at breakneck speed, with China becoming the world's second

largest consumer after the U.S. (Li, 2012) Under pressure from these trends, with supply not meeting demand, and added challenges from emission reduction plans, the Chinese government proposed an acceleration of energy diversification to bridge the gap between supply and demand, and to help meet emission reduction targets in both the Eleventh and Twelfth Five Year Plans. (Information Office of the State Council of the People's Republic of China, 2006; Information Office of the State Council of the People's Republic of China, 2011)

Figure 9 shows that Japan is also in the process of modifying its suppliers by reducing dependence on the Middle East for crude oil imports, with the share of Russia and other countries increasing year on year. (International Energy Agency, 2013) This indicates that Japan is focusing its efforts on diversifying supply. Further to this, the Japanese government has promised to meet the CO_2 emission target of reducing 2020 emission levels to 3.8% lower than 2005 levels, or 3.1% above 1990 levels. (International Emissions Trading Association, 2014) In fact, this is far removed from Japan's original plan of reducing emissions by 25% on 1990 levels by 2020. (Japanese Ministry of Environment, 2013) Nevertheless, Japan, just like China, is under pressure to switch to clean energy usage to meet ambitious targets. Thus, both Japan and China are following strategies of energy source diversification and clean energy exploration; these strategies are leading to further symmetry in terms of energy.

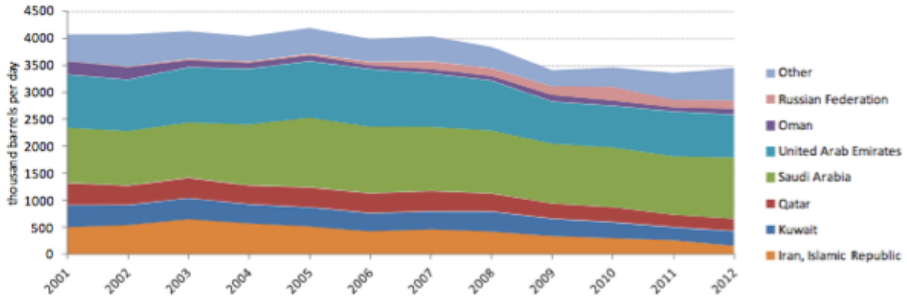

Figure 9: Crude Oil Imports by Source (International Energy Agency, 2013:9)

In short, both players have the same resources and the same requirements. According to assumption Five[34] China and Japan are unlikely to achieve successful cooperation on energy due to this symmetry. In addition, the global energy supply system cannot meet growing demand, meaning that suppliers are limited and competition from net exporters is intense. As Milner (1997) argues, international actors' concern regarding the influence of cooperation on domestic distribution of energy supply is one of the key impediments to successful cooperation. In addition, non-renewable sources such as crude oil and natural gas have fixed distribution and reserves, meaning that both China and Japan hope to occupy as much as possible of these depleting resources. As a rising power, China is determined to find its place in the current international energy supply system, and will thus inevitably encounter conflict with concerned traditional energy importers such as Japan.

[34]Assumption Five: Co-opetition is existed in two asymmetrical players.(Details have been examined in section 2.1.3)

The deductions in Chapter Two can be applied to consider Sino-Japanese relations in terms of game theory. China is P, and is at level xP, while Japan is Q and at level xQ, and (Q>/P+1). In the allocation of the Asian energy market, the amount of imports is fixed. Thus, according to the payoff matrix shown in Table 11, China and Japan will not achieve cooperation; as both players want to obtain the largest interest, both will chose defection.

Table 11: Payoff Matrices for Energy Allocation in the Asian Energy Market

	Q C (Cooperation)	Q D (Defection)
P C (Cooperation)	(4,4)	(1,5)
P D (Defection)	(5,1)	(2,2)

Whether cooperation on energy exploration in the East China Sea will succeed is a different payoff, and it depends on how the two players view energy – as a private good or as a public good. Both China and Japan deem energy to be a private good and thus focus on how to obtain the largest possible interest. As we know, oil imports into the Asian market are at a fixed level, so both China and Japan hope to explore potential energy reserves in the East China Sea to increase their supplies. The total outcome of exploring the East China Sea is *b*, the cost of exploration is *c*, and *b*>*c*.

Table 12: Payoff Matrices for Exploring East China Sea Energy

	China (Explores)	China (Does not explore)
Japan (Explores)	(*b-2c, b-2c)**	(*b-c, -c*)
Japan (Does not explore)	(*-c, b-c*)	(0, 0)

It can be found that the Nash equilibrium occurs when both China and Japan take action and the payoff of both parties is at *b*-*2c*. However, both want to obtain a payoff of *b*-*c*, which represents the largest interest for both, leading to the failure of cooperation on joint development. As a result, as the two players deem energy a private good, efforts at cooperation will fail. In other words, the joint exploration will be difficult.

The second approach to the players in the Sino-Japanese game is related to how many players are in the game. The original two-player Sino-Japanese game is extended to at least three players, reflecting the existence of a complex range of players with complicated interests. This can include the United States' plan to re-assert influence in the Asia-Pacific, Russia's ambitions for the Northeast Asian market, and struggles in the energy supply market. With the intervention of the United States and Russia, the game of Sino-Japanese co-opetition is even more complex.

In terms of a third player, the major dispute between China and Japan is the Russian Far East energy market, particularly in terms of laying pipelines. In Chapter Five, which discusses Sino-Russian energy co-opetition, the issue of pipelines will be investigated at length again, but from the Sino-Russian perspective. Originally, China and Russia had agreed to construct the Angarsk-Daqing Line, which would have been 2400 km in length and would have cost Russia $1.7 billion, with China providing 50% of the funding through loans. If Japan had agreed to cooperate on the building of this pipeline, the

players could have shared the construction and management costs and oil revenues. However, due to their fear that China would pose an even greater threat to Japan in the Asian energy market after completion of the pipeline, the Japanese proposed a different 3765 km line from Angarsk to Nakhodka, with all of the cost – nearly $5 billion – borne by Japan. The final outcome was the decision that the pipeline would serve both China and Japan, and that not only would Japan provide the $5 billion, but China would also put in $12 billion in loans for the project. (Vassiliouk, 2008) In terms of numbers, there are only three players in the game: China, Japan and Russia. It can be seen that no matter what approach Russia takes to the cooperation, it will obtain the largest interest, and that Sino-Japanese cooperation involves the smallest investment and largest interest for Russia. In other words, the intense competition between the two sides can create increased revenue for third parties, but the original two players do not obtain more gains.

4.2.2 Added Value within a Lower Degree of Complementarity

The degree of complementarity, *R*, is an indicator of added value and it is currently relatively low between China and Japan in terms of energy imports. Solving energy security through increasing energy supply includes two aspects – increasing energy imports and improving technology to increase the exploration of new alternative energy. In terms of cooperation on energy

imports, in the formula $P=(X+Y+RXY)$, where P represents common interest, R is small, even close to zero, because of the high similarity of China and Japan's energy strategy. The lower the value of R, the smaller the common interest P will be. Thus, with less common interest, it will be difficult to achieve cooperation.

Although complementarity in terms of energy imports is low, economic complementarity is higher. The end of China and Japan's energy trade did not have a major overall effect on economic cooperation, which continued to grow rapidly. (Yu et al., 2010) Thus, the higher degree of economic complementarity cannot be denied; in the Sino-Japanese context, economic cooperation is a significant driver of energy cooperation, but only in terms of renewable, clean energy and energy reservation. According to Stern (2003), the relation between energy demand and economic growth present a positive correlation. In other words, energy demand and economic development grow in sync. China's energy development confirms this pattern, as energy demand has been increasing in step with the economic indicator of GNP. (Yin and Wang, 2011) Further to this, as Chi-Hung (2004) states, China and Japan's economic conditions make a good match for cooperation due to their mutual complementarity. Japan has abundant finance and needs to continue focusing on developing intra-industry trade, but is limited in terms of land and labour. (Porter, 2011; Lincoln, 2000) Pomeranz (2000) compares this with China, which instead has vast land space, a highly labour-intensive

economy, and an urgent need for investment, producing conditions of complementarity. However, with increasing labour costs in China, it may be that China's labour advantage disappears, reducing the degree of complementarity and triggering further failure in energy cooperation. Liu and Wang (2011) counter that increasing labour costs in China will not catch up with the fast growing GDP and labour efficiency, so China is unlikely to lose this competitive advantage any time soon. Thus, both China and Japan could benefit from this long-term complementarity by resolving Japan's land and labour issues through the location of overseas plants in China.

In conclusion, the degree of complementarity on energy importingis unlikely to facilitate Sino-Japanese cooperation, whereas economic complementarity may be somewhat conducive to cooperation, at least in terms of the exchange of advanced technology to solve issues of energy security.

4.2.3 Rules: Difficulty in Establishing Commitment

In terms of rules, two aspects may guarantee successful cooperation: the establishment of commitment and the establishment of reciprocity. In Chapter Two, it was discovered that repeat games can increase commitment. In other words, the regular meeting of countries can play a significant role in establishing commitment. For instance, on April 11th 2007, the Sino-Japanese Joint Press was released. As The Central People's Government of the People's Republic of China (2006) states, the two countries confirmed their

win-win cooperation agreement and consensus on building peace, cooperation and friendship across the East China Sea. This statement mentioned peaceful cooperation on the East China Sea marking a first step in establishing commitment. In addition, as an interim arrangement before the final delimitation, both of the parties had the responsibility of exploring and protecting this area based on the principle of reciprocity. (The Central People's Government of the People's Republic of China, 2006) In the Foreign Ministry Spokesman Qin Gang's regular press conference, he responded to questions about the East China Sea by stating that the joint development was based on a disputed area of sea, not the area that are currently being unilaterally explored by China, and as a result China will not stop exploration of these oilfields. (Office of Ministry of Foreign Affairs of the Republic of China, 2007)

Later, in December 2007 at the First Japan-China High-Level Economic Dialogue meeting, energy was discussed again. As the Ministry of Foreign Affairs of Japan (2007) stated, both sides are committed to cooperation in specific areas, such as energy conservation and environmental protection. This meeting is the extension of the Sino-Japanese Joint Press, but also touches upon the issue of the sensitive East China Sea and focuses on the topic of joint development on new energy and energy reservation.

In order to establish long-term commitment, a condition of positive *tit for tat* is vital, so that positive actions encourage subsequent positive actions. In 2007, China became Japan's largest economy partner and in 2009, bilateral

trade reached $232.18 billion. (Zhnag, 2010) In 2008, Hu Jintao visited Japan, and issued the Joint Statement between the Government of Japan and the Government of the People's Republic of China on Comprehensive Promotion of a *Mutually Beneficial Relationship Based on Common Strategic Interests.* As Xinhua News Agency (2008) reports, the two sides declared their intention to increase mutual trust in politics by establishing a mechanism for the periodic exchange of visits by the leaders of the two countries.

This atmosphere of cooperation faltered dramatically in 2012 when conflict over the Diaoyu/Senkaku Islands intensified. The Japanese government unilaterally announced the nationalisation of the islands, claiming they had been legitimately purchased; a move which was met with outrage in China. This conflict has left a rift in Sino-Japanese relations which leaves many unanswered questions regarding East China Sea cooperation. (Xinhua News Agency, 2012c) Japanese actions are deemed by China to be a serious betrayal to which China had no choice but to respond. The Chinese government drafted a white paper to solemnly denounce Japan's behaviour. (Information Office of the State Council of the People's Republic of China, 2012a) Meanwhile, trade between the two states dropped by 43%. (Wang, 2014)

The second aspect relating to rules is reciprocity. The documents from recent meetings and official speeches almost always mention the concept of reciprocity. From the first Joint Communiqué in 1972 to the latest joint

statement in 2008, each have used the term *reciprocal*. For example, in the first Sino-Japanese Ministerial Energy Cooperation Dialogue, the two parties signed a joint press statement in order to implement a reciprocal large-scale exchange programme on saving energy, alternative energy and new energy exploration. (The Central People's Government of the People's Republic of China, 2007) The Sixth Japan-China Energy Conversation Forum also clearly outlines the plan to achieve reciprocity:

When promoting Japan-China cooperation in the fields of energy conservation and energy, enhancement of business between the countries would be the most realistic strategy to realise improvements in energy conservation and environmental fields through the diffusion of Japan's advanced technology in China's enormous market in particular. Based on this idea, concerned parties of considerable influence in these fields from both countries will meet together so as to increase specific business and cooperation opportunities through improvement of mutual understanding. (METI, 2011)

In conclusion, reciprocity has always been advocated in Sino-Japanese energy cooperation, and has been brought up at every Sino-Japanese bilateral meeting. Unfortunately, commitment and reciprocity cannot be established through a repeat game in joint development and exploration because the Chinese government deems Japan's actions a betrayal, which has upset the chance of positive *tit-for-tat* in the repeat game

scenario. In other words, in terms of the assumption seven[35], it is difficult for China and Japan to establish and adhere to commitments, even if there are attempts at reciprocity. Nevertheless, although cooperation is out of the picture in terms of joint exploration of areas with disputed territory, it can be said that cooperation is still possible in other areas, such as in aspects of energy supply.

4.2.4 Tactics: Play Tough or Compromise

Current Sino-Japanese energy cooperation focuses on three aspects. The first is advanced energy-saving technology. The first time China officially mentioned energy conservation was in 2004, but Japan has been paying attention to this issue since the 1970s, establishing the *Energy Conservation Law* in 1979. (Nishiyama, 2013) By the end of 1982, the total output capacity of nuclear power generation equipment was 12.3% and nuclear power installed capacity was 9.2% of the world total, after the United States, France and the Soviet Union. Due to the implementation of its energy-saving plan, Japan's dependence on foreign oil dropped sharply by 51.8% after the two oil crises. (Wang, 2012b)

However, the outlook for energy-saving in China is less positive. According to the National Bureau of Statistics of the People's Republic of

[35] Assumption Seven: Establishing commitment and reciprocity help achieve co-opetition. (Details have been examined in section 2.1.3)

China (2006), from 2000 to 2006, GDP increased at a high speed, but the efficiency of energy utilisation[36] decreased year on year. Although this problem showed signs of slight improvement after 2008, there are still significant levels of waste. (National Bureau of Statistics of the People's Republic of China, 2012) As Deng (2007) explains, this kind of trend demonstrates that the Chinese economic growth model is characterised by high and extensive consumption levels, leading to intense energy demand and serious environmental pollution. As a result of this situation, the Chinese government put forward propositions for saving energy and improving energy efficiency in the 11th Five Year Plan. Japan is able to extend an olive branch by cooperating with China on this issue, which is extremely helpful for China's energy-saving strategy. For instance, in the Sixth Japan-China Energy Conservation Forum, 51 projects on energy conservation were agreed, the largest number to date. (METI, 2011)

The second area of cooperation is the energy reservation system. Japan's strategic petroleum reserves system is fairly complete. It was established in the early 1970s and after the introduction of the *Petroleum Reserve Law,* the government and private companies were compelled to reserve oil. (Nishiyama, 2013) On the other hand, the government of China only began to focus on the importance of energy reserves in 2001. Therefore, under equivalent circumstances, the Japanese government can supply 92

[36] Efficiency of energy utilisation is indicated by GDP/total energy consumption.

days of oil and private enterprises can support an additional 79 days, totalling 171 days, whereas China can only guarantee 21.6 days of reserve oil supply. (Zha, 2004)

To counter this instability, in the Eleventh Five-Year Plan the Chinese government proposed the development of strategic energy reserves. (Information Office of the State Council of the People's Republic of China, 2006) Even if this plan is successfully implemented, by 2020 China's energy reserves will only hold 90 days' usage, which is the lowest IEA reserves requirement. (Jiang and Luo, 2012) In other words, China still has a long way to go in terms of energy reserves. Thus, as Harrell (2013) illustrates, various Japanese companies such as Hitachi, a leader in energy-saving and environmental technologies, are involved in joint management and design of model projects under way in cities such as Kunming, Ningbo, Dalian and Chongqing.

The third aspect is cooperation on the Clean Development Mechanism and environmental protection. According to the U.S. Energy Information Administration (2013a:1), 'Japan is one of the major exporters of energy-sector capital equipment, and has a strong energy research and development (R&D) program supported by the government. This program pursues energy efficiency measures domestically in order to increase the country's energy security and reduce carbon dioxide (CO_2) emissions.' Thus, Japan's Clean Development Mechanism is fairly mature. On the other hand,

current typical Chinese energy sources involve combustion, which releases large amounts of CO_2, leading to a series of environmental problems. Furthermore, due to the increasing pressure from international society on emissions reduction, China has no choice but to take steps towards reduction and actively find new sources of alternative energy. Thus, according to the Xinhua News Agency (2007), China is keen to strengthen cooperation on sustainable development in order to build a resource-saving and environmentally-friendly country by learning from Japan. In 2007, the Chinese and Japanese governments published the Joint Communiqué on *The Promotion of Cooperation in the Field of Environment and Energy* which hoped to focus on cooperation on new clean energy. (The Central People's Government of the People's Republic of China, 2007)

Within game theory, this pattern is in accordance with the evolutionarily stable strategy in the Hawk-Dove game. In the cooperation on the three aspects outlined above, the two sides are clearly not evenly matched and possess asymmetrical resources. In the game, the resource that China can obtain is *x*, and so Japan can obtain 1-x, and $0.5<x<1$. The conflict cost is C, which represents the two sides following different strategies (dove or hawk) and the cooperative cost is V, where both sides follow the same strategy (both dove or both hawk), and b represents common interest. The premise of the Hawk-Dove Game is $C>V$ (because Japan's help with supplying technology to China can allow China to obtain more interest than before).

(1)When *C>V* and both China and Japan choose the hawk strategy, the payoff for Japan is *b(1-x)(v-c)*, while China can obtain *bx(v-c)* and the total payoff is *b(v-c)*

(2)When *C>V* and both China and Japan choose the dove strategy, Japan's payoff is xv while China's (*1-x)v*

Table 13: Payoff Matrices for the Asymmetric Hawk-Dove Game (Liu et al., 2012)

Strategy	China (Dove)	China (Hawk)
Japan (Dove)	(*xv,(1-x)v)*	(*0,v*)
Japan (Hawk)	(*v,0)*	*b(1-x)(v-c), bx(v-c*))

Looking at China's payoff, it can be found that the lowest payoff is when both China and Japan choose the hawk strategy, and the largest payoff is when China alone follows a hawk strategy. Japan would also choose to follow a hawk strategy because, when China chooses to act as a dove, Japan's payoff from choosing the dove strategy is smaller than choosing hawk. That is to say, both of the two players would want to become a hawk, and thus the payoff is lowest.

In fact, as cooperation in these three aspects is successfully in progress, it suggests that where China plays the hawk, Japan has chosen to take the dove strategy in the game. In other words, deeper factors influence the outcome, including various external factors. Firstly there is the high degree of economic complementarity. Japan can obtain more benefit in economic

pursuits and thus Japan is willing to be the dove in this game of cooperation. Secondly, the transfer of energy-saving technology is not only beneficial for China, but it is also beneficial for Japan. Japan imparts its energy-saving technology to China, which means that China's energy consumption per unit is reduced. The demand for global energy supplies will therefore be reduced which means Japan can acquire a greater share. Furthermore, emissions problems are not bound by territory and can easily affect neighbouring countries, such as Japan and South Korea in the case of China. (Choi, 2009) That is to say, cooperation on transferring technology to China will contribute to resolving China's environmental protection, which will be beneficial for Japan and other nearby countries.

Thus, Japan is helping China by cooperating on energy-saving measures, reserves, and environmental protection in large part due to the two states' significant economic complementarity. This outcome is the result of an evolutionary strategy, but in terms of cooperation on energy supply, particularly the issue of exploration in the East China Sea, Japan is not content to concede to playing a dove in the game.

On the surface, Sino-Japanese energy co-opetition is a two-player game between China and Japan, but in fact, as mentioned previously, located within the context of international society, it becomes a finite dynamic non-cooperative game, and its complexity cannot be clearly explained by a model or an algorithm. This complex game is described as finite because the

players' strategies are limited, more or less restricted to war, peace and toleration. It is said to be dynamic because of the constant flow of domestic and international political and economic issues which directly affect the outcome. In addition, the game is non-cooperative because both parties want to obtain the largest relative gains rather than absolute gains. In addition, the game is a complex multiplayer game due to the fact that since the initial minimum of two players, the United States and Taiwan have also been inextricably incorporated. (Ministry of Foreign Affairs of Republic of China (Twaiwan), 2013) For political reasons there is some dispute as to whether Taiwan should be considered a separate country in the game, but for the purposes of this study, Taiwan has certainly been an active and separate player, and therefore can be considered as such. In such a complicated game with asymmetrical information, the static method of using a mathematical game theory approach cannot arrive at a win-win solution. Therefore the case of Sino-Japanese energy co-opetition must also call on basic ideological theory to consider possible strategies of joint development.

The traditional Chinese stance proposes 'harmony is most valuable and what you do not want done to yourself, do not do to others.' (Confucius, 1998:XV) While the new military white paper mentioned that China would not attack unless it was attacked, but it will surely counterattack if attacked. (Information Office of the State Council of the People's Republic of China, 2015) Thus, taking into account the agreements for shelving disputes and

engaging in joint development signed in 1978 and in 2007, and the fact that the joint development would continue to be pursued in the long-term, the Chinese government believes that Japan took advantage of China's hope for peaceful cooperation in the face of disputes, and aggressively nationalised the Diaoyu/Senkaku Islands in 2012. Nevertheless, still pursuing the benefits of long-term cooperation, the Chinese government took no action beyond issuing an official warning to Japan, and is still pursuing joint development opportunities.

Yet the Information Office of the State Council of the People's Republic of China (2012a:V) states that Japan's nationalisation of the islands has 'not only seriously damaged China-Japan relations, but also rejected and challenged the outcomes of the victory of the World Anti-Fascist War.' The use of the term *Anti-Fascist War* is a strong indicator of China's historical position towards Japan. Further to this, 'the Chinese government has taken active and forceful measures such as issuing diplomatic statements, making serious representations with Japan and submitting notes of protest to the United Nations, solemnly stating China's consistent proposition, principle and position, firmly upholding China's territorial sovereignty and maritime rights and interests, and earnestly protecting the safety of life and property of Chinese citizens.' (Information Office of the State Council of the People's Republic of China, 2012a:V)

According to this statement, up until this point, the Chinese government has still expected to use peaceful solutions to solve the territorial dispute, and at the very least to maintain enough peace to allow normal joint development. However, China was angered by what was seen as continuous Japanese provocation on issues of sovereignty like, for example, on 14th September 2012, six Japanese patrol boats roamed within 12 miles of the islands. Furthermore, in a Japanese newspaper, U.S. President Obama was reported to claim that 'the bilateral security treaty that obligates America to come to Japan's defence applies to the island disputes between Japan and China.' He opposes 'unilateral attempts to undermine Japan's administration of these islands.' (Benderich, 2014:para.4) These actions triggered the Chinese government to send out strong signals to lay claim to the Diaoyu/Senkaku Islands. For instance, the foreign ministry spokesman Gang Qin (2013:para.8) declared that 'the U.S. should respect facts, take a responsible attitude, remain committed to not taking sides on territory and sovereignty issues, speak and act cautiously, and earnestly play a constructive role in regional peace and stability.' On 2nd August 2014, Gang Qin argued that China has named all its subsidiary islands, which included the Diaoyu Islands, and stated that Japan's naming of the islands is invalid. (Qin, 2014) Following this, on 11th September, the foreign ministry spokesman Chunying Hua reaffirmed that none of Japan's actions could cause China to feel threatened. (Hua, 2014) All of these examples show that the Chinese government's

attitude is tending towards hawkishness, although the government does state that it welcomes peaceful methods to resolve the dispute.

The game in the Diaoyu/Senkaku Island mirrors the experience of Mao Zedong's nuclear blackmail. Just as in the Hawk-Dove game of Mao's nuclear blackmail, no matter which strategy Japan chose, China insisted on the hawk strategy. As the two sides continuously run into serious differences, concession cannot lead to cooperation. Building up national strength thus becomes the most rational tactic for both sides, rather than being forced to concede in recurring disputes. However, this attitude does not sit well with the peaceful coexistence espoused in *Hehe* culture, which may prevent China from becoming too hawkish.

Faced with this dilemma, increasing the number of players in the game can help to broker responsibility, but with the pre-condition that conceding sovereignty will be unlikely to occur, and only relevant players can join. Taiwan is an appropriate player which means that involving Taiwan in joint development may be beneficial. Geologically, the Diaoyu/Senkaku Islands are an extension of the Datun Hills of Taiwan (Ministry of Foreign Affairs of Republic of China (Twaiwan), 2013) and the Diaoyu/Senkaku Islands were considered sovereign territory in the Ming and Qing dynasties, predecessors to the current Taiwanese government. (State Council of Information Office, 2012) From historical and geographical perspectives,

Taiwan (or rather the Republic of China) has a strong claim to the islands and would therefore be a useful choice of additional player in the game.

However, due to the difficulty in pinning down Japan on this issue, this situation would require China to extend equivalent rights to Taiwan on the islands, such as joint oil and gas exploration or working together to protect the marine environment. However, as Japan was the first to offer an olive branch to Taiwan, cooperation has become more difficult. In April 2013, Japan and Taipei signed fishing agreements regarding the Diaoyu/Senkaku Islands region. (Hsiu-Chuan, 2013) Under these agreements, Japan will allow Taiwanese fishing boats in the islands' exclusive economic zone. China is therefore left with the option of focusing on relations with Taiwan, and persuading Taiwan that they have the right to fish in the territory without requiring Japanese permission to do so.

In conclusion, with reference to the assumption eight[37], the tactics between China and Japan are finite and complex; pure dependence on the tenets of *Hehe* culture strategy cannot do enough to bolster cooperation as following a hawk strategy in the game is the ultimate choice for both sides in overall Sino-Japanese energy cooperation. If bilateral cooperation cannot help China and Japan with shared energy security, do trilateral and mutual regimes offer a solution?

[37] Assumption Eight: Tactic in co-opetition is decided by states (Details have been examined in section 2.1.3)

4.2.5 Scope: A New Mutual Cooperation Mechanism

The scope for successful Sino-Japanese energy cooperation seems to be limited to the establishment of a mutually cooperative regime for regional energy security. In terms of the establishment of an Asian energy mechanism, according to Japan's Institute of Energy Economics (2004), in order to protect its long-term energy security, Japan should focus on the establishment of a stable international energy mechanism, based on a multilateral framework, and in particular, aim to consolidate the relations between Japan and other Asian energy consumers. This demonstrates that Japan has the will to cooperate with other countries in building an energy mechanism. At the third ASEAN+3 energy ministry summit, the construction of regional cooperation measures to handle regional energy security was proposed. (The Central People's Government of the People's Republic of China, 2009) The most recent energy meeting of APEC also advocated regional cooperation to contribute to energy security in the Asia-Pacific area. (Zhang, 2014) However, Japan's actions in this respect appear to differ from its words. According to Wu (2005), Japan's strategy in building an East Asian energy community seems to have been a policy of *dialogue with inhibitions*, which is to say promoting regional cooperation on the one hand, but attempting to forestall China's development on the other, in order to reduce perceived threats.

Why can establishing a mutual cooperation mechanism contribute to regional energy security? The first key factor is the importance of regional

energy security to ensure continuing stable supplies. China and Japan are closely located and share similar energy suppliers and energy type demands, and it is useful for both to explore nearby resources to ensure greater energy security. The U.S. Energy Information Administration (2012) estimates that the East China Sea has between 60 and 100 million barrels of oil and between 1 and 2 trillion cubic feet of gas in proven and probable reserves. China and Japan have also carried out research on the East China Sea, and establishing consensus on joint exploration can resolve a catalogue of problems in one fell swoop.

The second reason behind the importance of cooperation is that cooperation can secure energy transportation, particularly in terms of maintaining security of key transport channels such as the Malacca Strait. According to Luft and Korin (2004), in the year 2003 alone, 42% of global pirate attacks occurred in this infamous 500-mile-long strip dividing Indonesia and Malaysia. Despite the constant risk to maritime transport, China and Japan have no choice but to rely on shipping energy resources through the Strait: 'oil imports passing through the Straits of Malacca from the Middle East to Asia account for one-third of the total oil trade volume in the world.' (Asia-Pacific Economic Cooperation, 2009:53) In fact, for Japan and China, this proportion is even higher. According to Zhang (2005), 80% of Japanese oil imports must be transported via the Malacca Strait, while China's figure is even higher at 85%. By 2011, this had risen to 90% for Japan, indicating that

Japan's energy transport is in a precarious situation. (Yin, 2012) Therefore, cooperation between China and Japan can maintain the security of maritime transport; both will benefit from a stable and secure supply of energy.

The third area of regional cooperation is energy mechanisms to resolve the issue of the Asia premium. According to Doshi and D'Souza (2011), Asian importers of oil from the Middle East pay an average of $0.94 more per barrel than European countries, and more than $1 more than the United States. For Japan, increases in oil prices cause serious problems for small enterprises. (Ding, 2009) Furthermore, if oil prices rose by one U.S. dollar per unit, the cost of China's oil imports would increase by $1 billion annually. In 2005, because of rising oil prices, China had to pay over $15 billion more than in 2004. (Jiang and Zhang, 2007) As they continually point out, in 2003, 46.1% of OPEC crude oil was sold to Asia-Pacific countries, and Japan purchased 19.7% of the total, but this did not bring any discount to Asian countries. Jiang and Zhang go on to argue that if China and Japan work together, for example by joint bargaining over Middle Eastern oil imports, they may be powerful enough to influence oil prices.

This situation resulted in the Qingdao Initiative, which aimed to encourage Asian countries to promote fair energy price cooperation between energy-consuming and energy-producing countries. (Hu, 2004b) Although the issue of the Asia premium has been discussed at the Boao Asia Energy Forum and the ASEAN +3 forum, a consensus for its resolution is yet to be reached.

Regional energy security therefore relies on the establishment of mutually cooperative mechanisms regarding energy to reduce dependence on energy supply through establishing commitment (the Sino-Japanese bilateral establishment of commitment has resulted in failure as shown in Section 4.2.3).

If it is assumed that only China and Japan are in the system, the stock of overseas oil resources is *R*, and China's dependence on foreign oil is *D*, China will need to import oil from elsewhere to the amount of DR. Japan is left with access to the amount of foreign oil (*1-D) R*. As overseas oil resources *R* are finite, the only way for Japan to have freer access to more oil is for *D* to be reduced. Otherwise, if China increases its own imports, *D* will increase, whereas Japan's access to imports may decrease.

Consequently, it can be concluded that both sides would benefit from reducing the impact of *D* and alleviating the negative relationship of mutual restraint. Reducing the impact of *D* would require the establishment of long-term commitments, because without trust slight changes in *D* increase anxiety and may trigger preventive or damaging strategies which waylay attempts at cooperation.

APEC could be a possible choice of mutual cooperation regime to assist Sino-Japanese energy cooperation. In fact, the United States can significantly influence cooperation between China and Japan, and may present another stumbling block in Sino-Japanese cooperation. As Kelly (2005)

mentions, Japan's external relations are affected by the Japanese alliance with the USA, as this alliance is the cornerstone of Japan's diplomacy. According to Buzan (2010), the deterioration in Sino-Japanese relations has brought great benefits to the superpower status of the United States in Asia. During the time that Japan announced the nationalisation of the Diaoyu/Senkaku Islands, Japan's prime minister visited the United States, calling for strengthening of the US-Japan alliance. (Klingner, 2013) In addition, the Obama administration also promised to guard the security of the islands. As Sieg and Spetalnick (2014) explain, this reveals that the U.S. is pursuing a *return to Asia* strategy, meaning that both the U.S and Japan are strengthening security procedures. As a result, the energy competition between China and Japan can be seen to some extent as an indirect contest between China and the United States. Thus, with regard to the assumption nine[38], putting Sino-Japanese cooperation under this kind of mutual mechanism is perhaps not a wise move.

In conclusion, due to inferior domestic energy resources, Japan has to constantly locate energy imports from overseas markets. Meanwhile, with China and Japan located close to each other in Asia, sharing a similar energy import profile and future energy strategies, there is a strong likelihood of intense competition in the Asian energy market. Despite relatively little energy complementarity, the two sides do enjoy economic complementarity, which can spill over into cooperation on energy, particularly in terms of establishing

[38] Assumption Nine: Co-opetition requires step-by-step supervision from the international organisations. (Details have been discussed in section 2.1.3)

energy reserve systems, improving energy conservation and developing new clean energy alternatives, as well as joint bargaining to reduce the Asian premium on oil imports. The difficulties the two parties share in establishing commitment dictate that cooperation cannot exist in bilateral cooperation.

Cooperation between China and Japan is, however, not impossible; a critical factor is the establishment of a clear framework for energy organisation. In other words, in assumptions one and nine, international organisation can help supervise co-opetition but cannot replace the position of a state. For success in Sino-Japanese energy cooperation, it would be beneficial to sidestep APEC, which contains too many alternative players and runs the risk of interference from third parties. By establishing a separate East Asian energy agency, the two sides can involve only those most pertinent players and thereby reduce uncertainty. Within such a mechanism, the two sides can maintain their distinct nature whilst demonstrating respect for each other's equal development and constructing conditions of peaceful coexistence. In particular, establishing a joint energy reservation mechanism can help both sides make a timely response to any energy crisis. The two sides could also pool their strengths to supply foreign aid and thereby change the face of their energy development.

In all, the strategy of the two countries' co-opetition is based mainly on competition with minimal cooperation, and a clear future direction is the attempt to establish a mechanism for East Asian energy. In addition to this, if

the East China Sea issue is framed within the mechanism, it would be in China's best interests to bring in Taiwan and maximise potential Taiwanese advantage, as this would be one of the best strategies to ensure a win-win outcome for all.

Chapter Five: A Case Study of Sino-Russian Co-opetition on Energy

Chapter Four examined how co-opetition plays an important role in Sino-Japanese energy relations, clearly demonstrating that China and Japan are likely to cooperate on emissions reductions and the development of new clean energy. However, as any cooperation between the two states is built on the premise of economic complementarity, co-opetition becomes unstable whenever this complementarity of economic interests decreases. The chapter also explained how cooperation cannot exist for energy imports and joint exploration. In terms of energy, China and Japan are symmetrical powers, and both share the perspective that energy is a private good. As both sides strive for relative gain rather than absolute gain, it is difficult for cooperation to exist. Further to this, considering the existing dispute in the East China Sea, establishing bilateral commitment is difficult, and multilateral regimes seem to offer a more feasible solution. However, the intrusion of powerful third states such as the U.S. or Russia could adversely influence the outcome of co-opetitive efforts. To sum up, Sino-Japanese energy competition is struggling to get off the ground.

Compared with this, co-opetition between China and Russia is a different matter. Sino-Russian co-opetition is extremely complex, in large part due to the shared geographical and historical experiences of these two great

powers. Nevertheless, Russia remains an important energy supplier for China. Unlike with Japan, cooperation between Russia and China has not become so difficult over time, thanks to the two states' complementary geopolitical advantages. Even so, the development of Sino-Russian energy relations has been a long-winded and difficult process.

During this process, China has managed to negotiate a series of issues with Russia regarding energy, including energy prices, the annual amount of energy supply, additional energy transport fees, and even how to go about laying pipelines. Importantly, though, when attempting to engage in cooperation with Russia, it is not enough for China to only take pure investments and the establishment of infrastructure into consideration; the Russian Federation's national strategy puts realistic national interests at the forefront of all decisions, and this must also be taken into account. China and Russia are far more equal partners, though it could be said that in terms of energy, Russia holds the absolute advantage.

As a result, from a Chinese perspective, there are certain limitations to the potential of Sino-Russian co-opetition. However, this does not mean that co-opetition is out of the realms of possibility, and indeed the pace of cooperation has sped up since 2012. This chapter will discuss the specific application of Sino-Russian energy co-opetition, divided into two main sections. The first section will introduce the importance of Russian energy from the perspective of China's energy security, analysing Russian energy conditions,

and how these factors influence China's own energy security. The second section will move on to discuss the historical progress and specific development of Sino-Russian co-opetition. Finally, this chapter will analyse Sino-Russian energy co-opetition using the PARTS model of game theory.

5.1 Russia and China: New Relations for Old Comrades

Russian energy is of significant importance to China due to the two states' geopolitical relations and the abundance of Russian reserves which can help ease China's energy security. Access to Russia's reserves will go some way to resolving the principal problem plaguing China's energy security – supply cannot meet demand – as importing from Russia can provide a large amount of supplies in addition to greater import diversification. In addition, importing from Russia across land can offset another aspect of China's energy security, by reducing the security risk of reliance on maritime transportation. There is no doubt that Russian energy is of primary importance to China and presents a useful future direction for development.

China and Russia have been described here as old comrades with new relations due to the historical development of the Soviet Union, and later Russia, with China. Their relations will be discussed in greater detail in Section 5.1.2. The Soviet Union of course included other countries in addition to what

is now Russia, but it is only Russia that has inherited the formal status of the former Soviet Union, including, for example, the permanent seat on the UN Security Council. After the collapse of the Soviet Union, Sino-Russian cooperation on energy recommenced at a new starting point, but Russia's comprehensive national strength had been significantly reduced by the inner turmoil. (Yan, 2006) At that time, international oil prices continued on a seemingly unstoppable ascent, hinting at the potential power behind the possession of energy reserves. Due to this combination of circumstances, Russia changed its energy strategy, and according to Hill (2004), has transformed itself from a now-defunct military superpower to a new energy superpower. In order to maintain its status as a superpower, Russia has harnessed its vast energy reserves as its most effective approach. (Goldthau, 2008) Thus, within the Russian National Energy Strategy up to 2020, the objective for 2006-2010 was to accelerate the development of new energy resources and explore new markets, and the objective for 2011-2020 was to reform the energy transport infrastructure in the regions of Europe and Asia, develop international energy and transport systems, and provide targeted energy transit systems within the framework of Russia's strategic interests. (Ministry of Energy of the Russian Federation, 2003b)

China's relations with the former Soviet Union were complex, but have now metamorphosed into new relations with Russia, and can thus be dubbed *new relations with old comrades*. Although it seems that Sino-Russian

energy cooperation has been enjoying rapid growth, in truth it has taken a long and arduous process to reach a point where cooperation is possible. This difficult process has been shaped by the different energy policies of different eras. In the past twenty years, little progress has been made, but in the most recent four years energy cooperation seems to have entered the fast lane. For instance, the latest reports from Xinhua News Agency demonstrate that, according to a contract signed under the witness of Chinese President Xi Jinping and Russian President Vladimir Putin during their Shanghai meeting in May, a joint pipeline will transmit 38 billion cubic metres of natural gas every year from Russia to China over a period of 30 years starting from 2018. (Xinhua News Agency, 2014) In addition to the pipeline, China and Russia have ramped up cooperation in a wide range of fields, including finance, trade, and energy and transportation infrastructure. (Mu, 2014) Thus it can be seen that upon Russia's decision to explore the Asian market for energy in pursuit of the 2020 energy strategy, Sino-Russian cooperation in other areas also accelerated. Cooperation is certainly in accordance with both sides' requirements, but what exactly triggered this acceleration of Sino-Russian co-opetition? In order to understand the exact importance of Russian energy to China, discussing Russian's energy conditions and analysing the historical development of Sino-Russian energy are first necessary.

5.1.1 Russian Energy Conditions

With the current instability in the Middle East and increasing global energy prices, Russia's importance as an energy abundant country is unprecedented. According to the BP Statistical Review of World Energy in 2013, the proven oil reserves in Russia account for 5.2% of global oil supplies, and the reserves to production ratio (R/P) is 22.4. In addition, the EIA (2013) states that the proven natural gas reserves in Russia measure 1688 trillion cubic feet, and predicts that this will account for 24.7% of the world's reserves in 2014. In other words, it can be said that Russia possesses a massive proportion of the world's oil and natural gas reserves, granting it certain leverage in negotiating with other countries.

As Figure 10 below shows, the make-up of Russian crude oil exports has been gradually changing, with less reliance on the markets of Europe and the Commonwealth of Independent States (CIS), and greater reliance on the Asian market. This directly reflects Russia's strategy to explore and develop new markets. However, it can also be seen that the total export amount is on the decline.

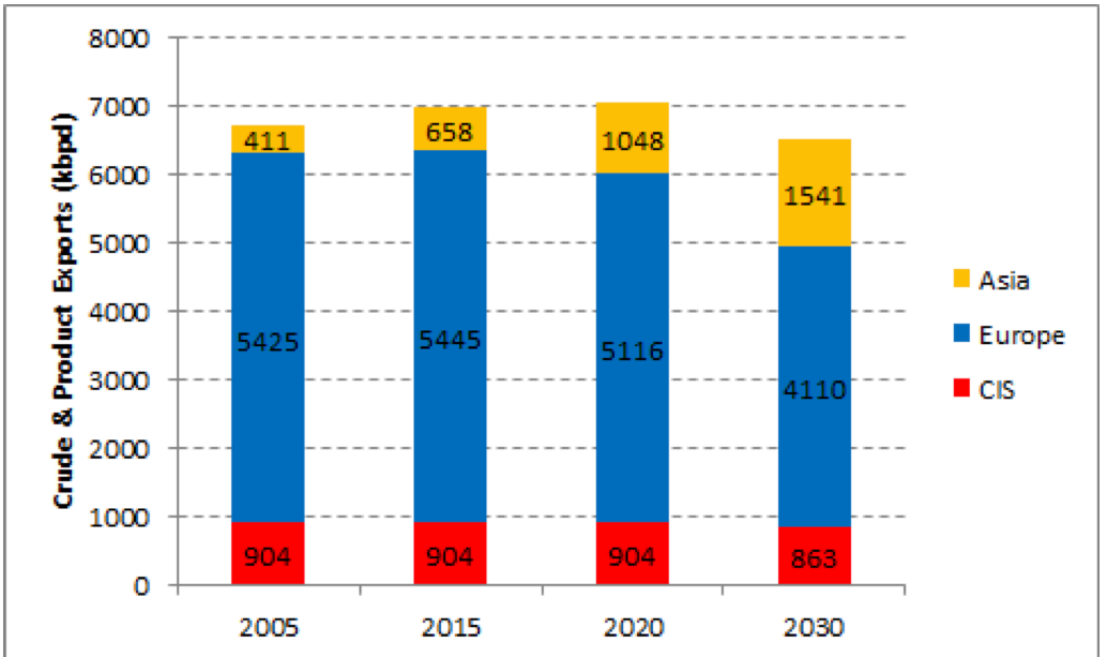

Figure 10: Predicted Russian Crude Oil Production (Henderson, 2012:5)

The reason behind the decline is revealed in Figure 11. Production of oil in Russia is expected to begin to decline after around 2020, decreasing rapidly year on year thereafter. It is predicted that by 2020, Russia's oil production will reach around 500 kbpd (thousand barrels per day). According to predictions, oil production is most likely to start falling after 2020, reaching less than 50 kbpd by 2048. Has the spectre of peak oil become a reality for Russia? Doubts are being raised as to whether it is wise for Russia to maintain such high levels of exports when production levels will soon go into decline. However, as Yep (2013:para.16) argues 'of course, peak-oil prognosticators have been wrong before. Just as the U.S. has been able to reduce its reliance on foreign supplies thanks to technological advances in recent years, Russia may also

find ways to tap additional supplies to meet its export commitments.'

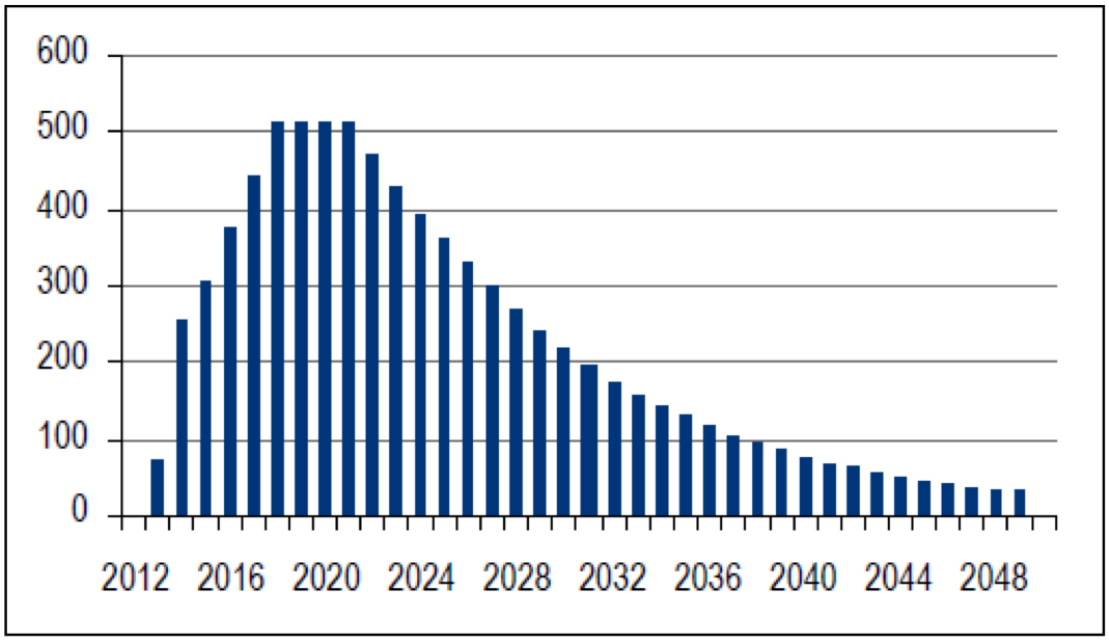

Figure 11: Russia's Oil Production from 2012 (Henderson, 2012:13)

In fact, currently, thanks in large part to the advantageous outlook for global oil prices, oil companies in Russia are striving to extract and explore as much crude oil as possible. (Pang, 2013) As such, crude oil production can be expected to continue for the short-term. However, due to the inefficiency of old technology and energy usage during exploration, this increase is predicted to slow down in the near future. Russia's proven oil reserves account for 5% of the world total, yet Russia continues to produce and export at maximum capacity, which has started to foment anxiety domestically. In fact, according to a recent report, at the current rate of oil production and exporting, and if no new technology is engaged to bring more reserves into production, Russia will exhaust all its accessible reserves before 2040. (Telhami et al., 2002)

So for oil importing countries, is reliance on Russian energy a stable option? Russian energy extraction may soon reach its peak, which will influence all areas of cooperation with other states which have grown from energy trade, including the various aspects of Sino-Russian cooperation. What's more, since the collapse of the Soviet Union, Russia has transformed itself from a military power to an energy power. Without energy reserves, will Russia follow the old road to collapse? It will be argued here that in the case of China, these doubts may be too excessive, as Sino-Russian co-opetition has precluded this possibility. In order to see how this has played out, the historical background of Sino-Russian energy co-opetition will first be outlined.

5.1.2 The Historical Development of Sino-Russian Energy Co-opetition

For ease of comparison across chapters, the historical development of Sino-Russian energy co-opetition has also been divided into four main sections, covering the chronological eras of Mao, Deng, Jiang and Hu. Energy co-opetition between China and the Russian Federation, including the Soviet Union period, has been developing over more than six decades, but the progress has been slow and at times unsteady. This is largely due to the differing national energy strategies, and the fact that, in terms of complementarity, China and Russia's different stages of development have

not always matched up.

Co-opetition in the Era of Mao Zedong

As with Sino-Japanese co-opetition, there were difficulties with progress in Sino-Russian energy co-opetition during this tumultuous era. At this point, relations were in fact with the former Soviet Union, not the modern-day Russian Federation. Co-opetition during this period went from honeymoon to rupture.

The main period of energy cooperation came in the 1950s. The two states were so close during this time that this can be seen as the *honeymoon period* of new China's relations with the Soviet Union. Closely following the maxims of the *Five Principles of Peaceful Co-existence*, China and the Soviet Union signed joint statements in 1954, advocating that both states will respect one another and will work to build equal and mutually beneficial cooperation. (Deng et al., 2013) According to Zhou (2014), during the period of China's *First Five Year Plan*, the Soviet Union provided aid for 156 major industrial projects concentrating on energy, power generation and heavy industry. In addition, Khrushchev's first visit to China in 1954 changed the face of nuclear energy development. Although, Khrushchev did not promise to support China's nuclear energy development programme in practice, he did suggest that Chinese specialists could train in the Soviet Union. (Peng and Zheng, 2009) Regardless of the Soviet Union's motivations for helping China during this time, it cannot be denied that Soviet aid allowed China to restructure its system and

begin a process of industrialisation. However, in truth the relationship was not one of co-opetition; the relations consisted more or less of a flow of aid from the Soviet Union to China without much capacity for reciprocity.

However, by the 1960s, China and the former Soviet Union had diverged ideologically and energy assistance was withdrawn by the Soviet Union. China was left to learn by itself to achieve self-sufficiency and self-reliance. (Woodard, 1980) Strictly speaking, the relations between the two countries became so strained that it is fair to say there was no co-opetition during this period. During the Soviet era, due to the atmosphere of tense confrontation between the East and West, a zero-sum game was more common than cooperation across the world. (Fang, 2012)

In conclusion, during the era of Mao, relations between China and the Soviet Union closely followed the *Five Principles of Peaceful Co*-existence, granting a 10-year honeymoon in terms of energy cooperation. But after the countries went their separate ways due to political reasons, energy co-opetition also fell through.

Co-opetition in the Era of Deng Xiaoping

Sino-Russian energy relations significantly changed in the era of Deng Xiaoping, because Deng's policy was to overlook ideological disputes for the sake of peaceful development and cooperation. (Gao, 1996) From 1978 onwards, Deng provided an opportunity for China to open up and for reform to flourish, creating an atmosphere of peaceful development that was highly

conducive to economic growth. This policy was an important step for the peaceful co-existence championed by traditional Chinese thought. During this era, China was able to escape the trap of basing relations purely on ideological conformity in the socialist camp, and could therefore initiate peaceful relations and cooperation with the Soviet Union despite their differences. As Moltz (1995) argues, the visit of Gorbachev to China in 1989 hinted at the beginning of the normalisation of Sino-Russian relations.

Indeed, with the introduction of Gorbachev's *new thinking* in the late 1980s, the Soviet Union's own energy diplomacy also began to change. The Soviet Union planned to leverage the favourable opportunity of East-West détente to strengthen their oil and gas diplomatic offensive. (Yu and Yang, 2010) However, in the difficult transition from the Soviet Union to the Russian Federation, the country was brought to the brink of collapse. In this chaotic period, the ensuing crisis led to a dramatic drop in the country's economic prowess, and at this point energy production also decreased. In order to re-balance this situation, active bilateral diplomacy and energy cooperation became the primary tasks of Russian foreign energy strategy.

As such, the era of Deng Xiaoping can be seen as a transition period for Sino-Russian co-opetition. Due to the intense economic pressure brought about by Russia's restructuring after the fall of the Soviet Union, the Russians had no choice but to seek cooperation with other countries, including their former adversary China. And by fortunate coincidence, the changes in

Russia's outlook came just as China's own reforms were accelerating.

In 1992, the two sides signed a Joint Statement on the Foundation of Mutual Relations between the People's Republic of China and the Russian Federation, and this point marks the shift from Sino-Soviet to Sino-Russian relations. (Chen, 1999) Xinhua News Agency (1992) explained that the statement stipulates that Russia and China would establish a good-neighbourly and mutually beneficial relationship, and also emphasised that the two countries would hold regular high-level talks to continue cooperative efforts. This statement once again reflects the fundamental *Five Principles of Peaceful Co-existence*, particularly the concept of working together for mutual benefit. Sino-Russian bilateral cooperation began to take shape, and a further 24 cooperative documents were swiftly signed, covering varied aspects such as trade, technology and culture, but at this point, still not mentioning energy. (People's Daily, 2000) This suggests that during the era of Deng Xiaoping, energy cooperation had still not reached the strategic level.

Co-opetition in the Era of Jiang Zemin

From the signing of this first joint statement in 1992, cooperation between Russia and China increased like wild fire. In 1994, another declaration, the *China-Russia Joint Statement*, was signed by Jiang Zemin and Boris Yeltsin, which reiterated the joint declaration of 1992 and further promoted cooperation in many fields including the military and the economy, taking into account

geopolitical and economic complementary advantages. (Xinhua News Agency, 1994) This document shows that in 1994, cooperation was still based largely on traditional national security. Energy cooperation at this point was restricted to cooperative efforts in the oil trade. The two sides had identified the added value of geopolitical and economic complementary for future co-opetition.

In April 1996, Yeltsin visited China, which was the true beginning of formal cooperation. During his visit, China and Russia signed the *Sino-Russian Joint Statement*, in which the two sides insisted on the principles of equality and trust when establishing their strategic partnership. Crucially, the two parties put energy cooperation at the forefront of their relationship. (Xinhua News Agency, 1996a) In December 1996, the two sides decided to establish a regular meeting mechanism for the Chinese and Russian prime ministers, and set up a special energy council to supervise energy cooperation. (Xinhua News Agency, 1996b)

On November 9th 1997 Yeltsin visited China once more, and the two governments discussed the issue of laying a gas pipeline from Russian East Siberia to China. (China Oil News, 2003) In the same year China and Russia signed an agreement for the implementation of cooperation on projects in the Kovykta natural gas fields. The conference paper *Kovykta Project Development* outlines the benefits of the project for Russia, China and Korea. Russia would benefit from greater profit due to increasing exports; China would achieve greater energy diversification; and finally, the project would help

relieve the strains on energy security faced by both China and Korea. (Griffith, 2005) However, the progress of the project was critically stalled. According to Zhuang (2004), on January 29th 2004, the Russian Gas Company announced that the Kovykta Project did not match Russian national interests as it would not allow Russia to sustain the requirements of developing a prosperous economy. So the plan to lay a gas pipeline from Irkutsk to China and South Korea was abandoned.

Perhaps one reason behind the Russian volte-face can be explained by the policy in Russia at the time. The era of Jiang Zemin in China roughly coincided with the rule of Boris Yeltsin (1991-1999) Yeltsin's energy policy during this period initially favoured the West due to the need to obtain greater economic support. (Liu, 2011b) Russia hoped to boost energy exports in order to exchange foreign currency, aiming to thereby resolve the country's worsening economic and financial situation. In fact, this period in Russian history was particularly shaky in many aspects, including the approach to energy. For example, with the aim of boosting exports, Yeltsin proposed changes to the export limitation regulations, and in February 1995, he decided to cancel oil export limitations and licences. But just one year later in 1996, Yeltsin re-instated the export quota limitations.

During the first significant phase of Yeltsin's period in office, from 1991 to 1995, Russian economic conditions were so unstable as to preclude Sino-Russian co-opetition. In fact, China passed up an excellent opportunity

for cooperation with Russia - after the collapse of the Soviet Union, the Russian economy went through a period of crisis, and the Chinese authorities were wary about investing in the country. China had also learnt to be self-sufficient in terms of energy, and at the time, the needs of its own national economic development had not yet reached today's desperate hunger for resources. Investing in Russia was not seen as a necessary or wise choice for China's energy security. In 1994, Russia proposed the construction of pipelines to China, but China showed insufficient interest in the project. (Liu, 2011a) The failure of cooperation at this point left its mark on the Sino-Russian co-opetitive relationship, meaning subsequent progress was slow and erratic.

The second significant phase of Yeltsin's rule was from 1996-1999. Cooperation between Russia and China seemed to be on the up. By this time, China's own rapid economic development was generating massive demand for energy. Due to these new challenges for China's energy security, the Chinese government became far more amenable to Russia, and even began to take the initiative on energy cooperation. However, at first Russia was somewhat reluctant to enter into cooperation with China, as after China's previous stalling, Russia had turned its focus toward establishing multilateral dialogue with Europe and other Asian countries. (Monaghan, 2006; Perovic et al., 2007) But in 1996, according to the Office of Minister of Foreign Affairs of the People's Republic of China (1998), China and Russia formally established strategic cooperative relations with the signing of the Sino-Russian Joint

Statement in 1996, which included Strategic, Cooperative, Partnership Relations Oriented toward the 21st Century. This agreement clearly denotes the importance of establishing strategic relations, but most importantly reveals that the two sides had noticed the importance of establishing bilateral mechanism under the premises of trust and mutual benefit. A cooperation committee was formally established in 1996 and various sub-committees were also established, including the meeting of the Sino-Russian Energy Negotiators.

In conclusion, during the Jiang Zemin era, Sino-Russian energy cooperation achieved a little progress, although no great strides were made. Both countries expressed the importance of energy cooperation and reached spoken consensus on the issue, but due to poor timing, China's initial inaccurate assessment of its own future energy needs, and Russia's strategy of leaning towards Europe, the two sides missed out on many excellent opportunities for cooperation.

Co-opetition in the Era of Hu Jintao

Sino-Russian co-opetition in the era of Hu Jintao has gone through many twists and turns over the decade, which can be attributed in no small part to the foreign policy of President Vladimir Putin. China's economic development has taken off and the country is in constant need of energy, particularly oil, to supply the demands of economic growth. China has therefore been

increasingly keen on enhancing cooperation with energy-abundant countries such as Russia.

However, Russia's own policies have not always directly aligned with China's needs. Putin has proposed two long-term national energy strategies – the 2020 energy strategy and 2030 energy strategy. In order to achieve the aims of energy diversification and national development entailed in these strategies, Russia is pursuing a comprehensive foreign energy policy. According to Balzer (2005), Putin's energy strategy includes cooperation with European CIS countries, Asia-Pacific countries, and even with North America. In the 2020 energy strategy, as Ivanov (2003) points out, the CIS countries are of primary concern to Russia due mainly to their geographic position. The European Union is also a traditional export market for Russia, but for oil and gas exports to reach most of Europe, they must pass through CIS countries. Stable energy cooperation with European CIS countries is therefore imperative for Russia's strategy both in their own right and for their gateway to Europe. The Asia-Pacific, on the other hand, represents a new, dynamic market. The 2030 energy strategy thus proposed that Russia's energy focus should turn to the East. (Ministry of Energy of the Russian Federation, 2003a) The strategy also points out the importance of China, Japan and Korea to the overall Asia-Pacific markets. (Ministry of Energy of the Russian Federation, 2010) Finally, North America, especially the United States, represents a potential future market for Russian energy exports, favourable due to advanced

technology and financial strength. It is arguable that Putin held this in mind when attempting to relieve the tensions of US-Russia relations by supporting the USA's War on Terror in 2001. (Stent and Shevtsova, 2002) Russia aims to establish energy cooperation on the basis of equality and mutual benefit, encouraging economic development and maintaining an overall balance in regional and global interests by engaging with the USA. (Åslund, 2005; Jaffe and Manning, 2001) Thus, although the Asia-Pacific, including China, does feature in Russia's overall strategy, Russia's plan for global diversification means that China has not been in a position to dominate the Russian energy trade.

Nevertheless, Sino-Russian energy co-opetition has still been improving in recent years. In 2000, Putin visited China for the first time, and China and Russia signed the Sino-Russian Government Agreement on Continuing Joint Cooperation on Energy. (Peng and Qian, 2000) In 2001, Russia and China signed an agreement to continue discussing the feasibility of constructing the Angarsk-Daqing oil pipeline. Then, in 2002, a seventh ministerial meeting was held, with both sides declaring their intentions to continue cooperation on the foundation of equality and mutual benefit. In this meeting, the two sides also discussed the possibility of encouraging greater cooperation between East Siberia and the Far East to meet China's energy requirements and take full advantage of the vast potential of the Far East markets. (Xinhua News Agency, 2002) In 2003, Russia signed a contract to

deliver 6 million tonnes of crude oil to China by railway, with a further 400,000 tonnes approved in 2004. (CNPC, 2013) It appears that cooperation was smooth during this time, but in fact, the results of these many agreements were not forthcoming. For example, the abandonment of the Angarsk-Daqing line plans in particular raised many doubts for Sino-Russian co-opetition. Putin's early desire to woo the U.S. market could explain the reluctance to follow through on Sino-Russian projects, slowing down the speed of co-opetition.

However, during the later stage of the Putin era (2004 onwards), due to the rapid economic development of the Asia-Pacific region and many Asian countries' subsequent rising demand for energy, the Putin administration began to initiate adjustment policies regarding Siberia and the Far East markets. Sino-Russian energy co-opetition began to make substantial progress. In the statement *Energy Strategy of Russia: For the Period up to 2030*, the Ministry of Energy of the Russian Federation (2010) particularly stresses the importance of cooperation with emerging markets in the Asia-Pacific region, and the main objective is to keep a stable balance between Europe and the Asia-Pacific. There is massive potential for Russia as the Far East is a relatively new market, so Russia intends to develop a balanced proportion of market share in Europe and Asia-Pacific, attaining stability through diversification.

In addition, although both the earlier Angarsk-Daqing and

Angarsk-Nakhodka pipeline projects were shelved, in 2006 approval was granted for the construction of the Taishet-Nakhodka line between Russia and Japan. (CNPC, 2013) Russia made plans to build lateral sidelines from this pipeline leading to Daqing in China. (Bellacqua, 2010) President Hu Jintao visited Russia in 2007 and signed Sino-Russian joint statements stressing bilateral cooperation and encouraging further cooperation on natural gas in the future. (Xinhua News Agency, 2007b) According to data from the National Energy Administration of China, due to the use of this pipeline, the oil imported from Russia reached 157,531,680,000 tonnes in 2013; 650,000 tonnes more than in 2012. (National Energy Administration of the People's Republic of China, 2014a) This suggests that Sino-Russian oil cooperation has recently been particularly successful.

Putin visited China once more in the year 2012. It is suggested that this visit marked an opportunity for the two sides to begin a new age of energy cooperation. (Perlez, 2012) Then, after becoming the Chinese President, Xi Jinping notably took his first overseas visit to Russia in 2013. During his trip, Russia and China signed 32 important contracts concerning coal, oil, natural gas and alternative energy. After 10 years of negotiation, a plan for establishing natural gas pipelines finally reached a formal agreement in 2014, with the objective of pumping natural gas from Russia to China by 2018. (Shen, 2014) In addition to cooperation on oil and natural gas, the development of Sino-Russian nuclear energy cooperation is also noteworthy. China and

Russia collaborated on the construction of the Tianwan nuclear power plant, which was officially put into use in 2007. (Yemelyanenkov and Gazeta, 2013)This indicates that China and Russia have stepped up cooperation beyond the bounds of traditional energy, but are also seeking significant advances in alternative, cleaner energy sources.

Energy cooperation between China and Russia seems to have reached a new level, which is based on the establishment and pursuit of common interests. (Yan, 2013) As discussed in Chapter Four, in addition to these common interests, China has also been encouraged to engage in greater cooperation with Russia to forestall the inroads of their competitor Japan into the Russian energy supply market. Although China must unavoidably remain aware of Russia's loyalty to its own national interests first and foremost, it seems that Sino-Russian cooperation is finally on the right track, after a long drawn-out period of unsuccessful or poorly timed attempts to work together on energy. In fact, as the Office of Minister of Foreign Affairs of the People's Republic of China (2014) reports, at the SCO summit in 2014 Xi Jinping and Putin themselves officially declared a new stage in the Sino-Russian comprehensive strategic partnership. This new statement aims to further improve energy cooperation not only for oil and natural gas, but also for new energy exploration and efficiency. (Office of Ministry of Foreign Affairs of the People's Republic of China, 2014)

To conclude, during the era of Hu Jintao, co-opetition on energy has

existed, with cooperation taking a greater share of the relationship than competition. However, Sino-Russian cooperation has been somewhat erratic over time, with much of this due to changes in national interests and the approaches of different leaders. The path of Sino-Russian energy relations has moved from cooperation to competition, back to cooperation, and most recently has moved into the co-opetition stage. Historically, Russia has been able to help solve China's energy security from the perspective of securing greater supplies and low-risk transportation, but in general Russia has been in a more favourable position than China, allowing Russian terms to dominate the cooperative relationship. In recent years the proportion of China's strength has grown, which may continue to have a heavy and possibly favourable impact on the co-opetitive relationship from China's perspective. In fact, it could even be the case that Sino-Russian co-opetition becomes so significant as to change the pattern of the Asian energy market in the future. In order to identify the possibilities of this development, the following section will employ the model of game theory to analyse Sino-Russian co-opetition.

5.2 Sino-Russian Energy Co-Opetition under the Model of Game Theory

5.2.1 Players: Asymmetrical Partners and Slow Progress

According to assumption five, it is easier for a relationship of co-opetition to be established between players with asymmetrical power. It must be reiterated that in this case, the 'power' mentioned refers to the resources that each side is able to access and obtain. In this sense, Russia and China are asymmetrical powers, which is conducive to greater levels of co-opetition. As this section will show, originally, Russia's absolute advantage was a complicating factor for successful co-opetition, but as China's position has strengthened and Russia's has weakened, Russia's absolute advantage has been somewhat eroded, leaving a relatively more balanced asymmetry.

In terms of players in the energy game, Russia's approach to energy co-opetition has moved on from only Russian Confederation countries during the Soviet era to a multinational approach which today involves countries worldwide, even the Soviet arch-enemy, the United States. Sino-Russian cooperation has moved on from being bilateral to being multilateral in nature. Bilateral cooperation between China and Russia also continues and has great potential, but as the previous section has shown, progress has been halting. Multilateral cooperation here refers mainly to projects such as the laying of oil

and natural gas pipelines with the involvement of a third country such as Japan. This is difficult to achieve, but if successful, brings benefit to all parties.

As Gulick (2007) points out, due to the high price of world energy and growing demand, Russia has been of increasing importance to China. The significance of Russia to China and the disparity of power mean that up until only very recent years, Russia had still been able to take the dominant position in Sino-Russian cooperation. The roles of Russia and China in terms of energy were almost purely that of a supplier and a customer respectively. Aside from investment and labour, the only other bargaining chip that China had was the added value of cooperation between the two states. (Nyiri and Saveliev, 2002) Although China had little to boost its negotiating power with Russia, co-opetition between the two did exist, but it came with a twist.

Essentially, the twist in this relationship is that the ultimate outcome of cooperation is dictated by the strongest player in the relationship. The example of Sino-Russian cooperation on pipelines is most illustrative. As early as 1994, Russian oil companies proposed the idea of laying oil pipelines from Russia to China. Russia suggested that the pipeline be laid across Mongolia directly to China, which is the shortest, most secure route. However, China wanted to take into consideration Daqing in the North-East of China, where China's major petroleum production has historically taken place. Daqing has fallen into gradual decline due to depletion, but as it has historically been a resource-based city, China hoped to incorporate Daqing into the plans in order

to revitalise it and make use of its historical infrastructure. (Burles, 1999) China thus proposed building the pipeline from Angarsk to Daqing, which would be a more difficult undertaking. This suggestion set the two sides at loggerheads and the game began.

Both China and Russia had two choices – to compromise, or to fight for their interests. If only considering pure economic interests, it would be rational for both sides to choose to fight. Even without the construction of an oil pipeline to China, Russia's oil can still fetch a high price in the European market. Meanwhile, at the time China's purchase of imports from the Middle East was roughly equivalent to the cost of oil transportation by pipeline from Russia, so there was no pressing economic need to use the pipeline to cut costs. (Zhu, 2009) In this case, this would put the two sides into deadlock, and if the situation didn't change, negotiations would eventually move to rupture.

However, in actual fact neither China nor Russia entered into cooperation purely for economic value. Economic benefit was a major part of the project, but was by no means the only consideration. As a rational players, maximising national interests is the most important objective and as a result, the real fundamental factor determining Sino-Russian strategies and actions is the two countries' respective national interests. So what precisely are the two sides' national interests regarding this matter?

For Russia, the government aimed to develop the Siberian and Far East regions by absorbing and attracting foreign investment in order to

stimulate economic development in the entire area. Russia thus considered the cooperative project from the angle of energy and economic security. Their preoccupation with the Chinese market was due to their aim to achieve diversity in energy exports and reduce the risk that their domestic economy would become over-reliant on the West. As a result, their optimal choice was to fight rather than let the Chinese side push for a compromise. Compromise would be a suboptimal choice for Russia, but in fact, no matter which approach ultimately led to the construction of an external pipeline, it would be beneficial for Russia's maximisation of national interests.

For the Chinese, the optimal choice was also to fight and make the Russian side give in to compromise. The suboptimal strategy was China's own compromise. Since 1993, China had become a net oil-importing country. Meeting the rapidly growing energy demand was the most important issue in China's energy security. (Downs, 2000) Importing energy via rail or pipeline from Russia were both far less risky options than the sea transport necessary from Africa and the Middle East. As a result, choosing compromise in the game was also an acceptable choice for China. In other words, as long as the outcome of cooperation is ultimately successful, both Russia and China will be able to maximise their own national interests whether they do so by struggle or by compromise. In conclusion, under the absolute advantage of Russia, the Chinese government still would like to accept the offer proposed by Russia due to considerations of national interest.

However, further to this dynamic of bilateral cooperation, Sino-Russian co-opetition has also encountered new variables due to the participation of third parties. As assumption five mentions, co-opetition is always more stable between just two players than multiple players. In this case, the intrusion of extra players was as a result of the extra costs to China of choosing to cooperate, as the huge cost of initiating and completing a pipeline project represented a security dilemma in public goods. Negotiations over the ultimately unsuccessful Angarsk-Daqing Line project took 10 years. According to Sina Finance (2008), the length of the pipeline would include 795 kilometres within Chinese territory and 1450 kilometres in Russia, and according to the cost estimates and the differing lengths within the two countries, it was expected that China would pay $8 billion and Russia would pay $17 billion. In addition, each side would stump up $15 million – half of the 30 million dollar fee for prior research into the feasibility of the pipeline. However, Russia was not satisfied with this even splitting of costs, and requested that China pay half of the Russian expense for the pipeline, adding $8.5 billion to China's expenses for the project. For Russia and China, the game thus centred around how to negotiate and allocate each side's specific expenses, with the following potential outcomes:

1) If China promised to cover half of Russia's costs in the project, China would need to pay 0.15+8+8.5 = 16.65 billion dollars. Russia would have to pay 0.5+8.5 = 8.65 billion dollars.

2) If Russia paid its own costs for the pipeline laid in domestic territory, Russia would be required to pay 0.15+17 = 17.15 billion dollars. China would pay 0.15+8 = 8.15 billion dollars.

3) If the cooperation broke down then neither side would have to pay the costs for laying the pipeline, although each side would still pay the 0.15 billion dollars apiece for the prior research.

The payoff matrix regarding the costs of laying the pipeline in Russian territory can thus be drawn as follows:

Table 14: Payoff Matrices for Pipeline Costs in Russian Territory

Strategies	Russia (Cooperation)	Russia (Defection)
China (Cooperation)	(8.5, 8.5)	(8.5, 0.15)
China (Defection)	(0.15, 17)	(0.15, 0.15)

Both China and Russia had two choices before them: cooperate with each the other side, or betray by refusing to bear the cost. If Russia chose to cooperate on the pipeline costs and unilaterally pay their share, then the cost would be 17 billion to them. If the two sides were able to reach a mutual commitment then both would pay half of the 17 billion price – $8.5 billion each. Finally if both sides refused to bear the cost of construction in Russian territory, then the Angarsk-Daqing Line project would fall through. Neither side would gain from this, although both sides would minimise their costs. The $30 million spent on research would also be wasted.

Consequently, this game fell into Prisoner's Dilemma if deem energy supply as a public goods. Contrasting the four possible strategic combinations, only (-0.15, -0.15) can achieve the Nash equilibrium. That is to say, no matter which action either side prefers to take, if the other side refuses to bear the cost of construction, the best choice for both is to also refuse to bear the costs.

Faced with this dilemma, the suggestion of the Angarsk-Nakhodka line by the Japanese presented Russia with a convenient solution. Changing the terminal of the line from Daqing to Nakhodka would allow Russia to obtain more investment from Japan. As Vassiliouk (2008) mentions, Japan was fully prepared to supply $50 billion to Russia in order to ensure that the entire pipeline was completed successfully. This was due to Japan's domestic need for greater energy diversification. The amount the Japanese were willing to invest was markedly higher than the amounts Russia was attempting to negotiate with China. Further to this, by constructing a terminal at Nakhodka in Russian territory, Russia would avoid restricting the pipeline's supply to one sole customer – China – as it would with the Angarsk-Daqing Line. From the Nakhodka terminal, Russia could supply potential customers in all of North East Asia and even cross the ocean to the Americas. It was thus in Russia's greater national interests to withdraw from the Angarsk-Daqing negotiations and begin the Angarsk-Nakhodka project (although this was changed to the Taishet-Nakhodka line at a later stage due to other domestic considerations by Russia, including the environmental impact of the pipeline).

From the Russian standpoint, once Japan introduced the possibility of the Angarsk-Nakhodka line, whether China chose to cooperate or betray became inconsequential. Choosing betrayal would lead to greater gains for Russia than cooperation. As a result, for Russia, China's suggested Angarsk-Daqing line was no longer the optimal choice, and it did not offer the full maximisation of Russia's interests. Firstly, the Angarsk-Daqing line would lead straight down to Daqing, with around half the pipeline in Chinese territory. But the planned route of the Angarsk-Nakhodka line lay across the entire Far East region of Russian territory, which would be conducive to the development of related industries along the pipeline route. The Angarsk-Nakhodka line would be far more beneficial for the development of the local economy in the Far East and Siberian regions than the Angarsk-Daqing line.

Secondly, the scope of Russia's oil exports had been increasingly expanding, radiating across North-East Asia, including China, but spreading as far as the United States. The pipeline to the Nakhodka terminal in Russian territory would enable more spin-off than the Angarsk-Daqing line. China would be the sole customer of the Angarsk-Daqing line, with the terminal lying in China.

Thirdly, according to the original plans for the Angarsk-Daqing line, Russia would need to afford a $17 billion outlay, with 50% financed by China, to construct the pipeline in Russian territory. However, for the construction of the Angarsk-Nakhodka line, Japan had agreed to provide $50 billion which

would be sufficient to complete the pipeline. (Vassiliouk, 2008) Choosing Japan would save Russia a huge amount of capital.

Finally, another reason that Russia abandoned the Angarsk-Daqing line plans was the ecological pollution it would trigger. The Angarsk-Daqing line would need to cross the Tuningsiji National Park, just 20 km from Lake Baikal, which would cause unwarranted pollution to that area. (Blagov, 2004) When all these considerations are taken into account, it was inevitable that Russia would choose to abandon the Angarsk-Daqing line when a more favourable option was readily available.

In this case, as China was in a weaker position, Russia chose to betray for the sake of their interests. For China, there was little choice but to bend, and ultimately begin compromise on a different solution, building a branch of the pipeline to Daqing, to which Russia did agree. That is because Sino-Russian relations at this point fell into the Dictator Game category, in which maximising profit does not always reach Pareto optimality due to the pressure of reputation and long-term stable development. As discussed in Chapter Two, in the Dictator Game, the final result is dictated by the strength of the most powerful player. Or in other words, in this case, no matter how China chose to bargain, the final outcome – the allocation of gains – would always be decided by Russia. Whether or not to bother with the Daqing branch was also up to Russia, and for the sake of maximising interests, Russia chose to go ahead with the project. As in the initial negotiations, China would be

responsible for covering the costs of the pipeline in Chinese territory, and Russia would still gain from increased oil exports to China. This case shows that in the case of absolute Russian advantage, with the final outcome resting on Russian assessment of their own national interests, the progress of Sino-Russian co-opetition was doomed to be slow and twisting.

However, in recent years the speed of co-opetition has sped up, and this can be attributed to the adjustment of the degree of power asymmetry. In addition to Russian and Chinese domestic factors, various external factors have also influenced Russia's position in terms of energy advantage.

Firstly is the occurrence of shale gas extraction, which adversely influences the potential of the energy market. The success of shale gas exploration and development in North America has encouraged Russia to re-consider the future of its natural gas supply, giving Russia the potential scope to break into the Far East market. (Ernst & Young, 2011) In 2011, China imported nearly 30 billion cubic metres of natural gas, and it is predicted that in the next five to eight years, China will begin to import more than 100 billion cubic metres per year. While China's proven reserves of natural gas only equal 7% of Russia's total reserves, technically recoverable shale gas resources in China amounts to 36.1 trillion cubic metres, ranking first in the world. (IEA, 2012a) It is conceivable that China could explore shale gas and thereby reduce its reliance on Russian supplies. In short, the discovery and

exploitation of shale gas could reduce the likelihood of either side to engage in sustained cooperation, particularly in terms of natural gas.

A second factor is the difficulty of energy exploration. According to research by Dienes (2004), even though Russia currently possesses a large amount of oil resources, this situation can only be temporary if Russia is unable to explore new reserves. Dienes (2004) goes on to state that a great deal of evidence indicates that the recent increase in oil exploration in Russia centres upon the exploitation of oil resources that had not been explored in the past 20th century. But since 1999, only a few companies have invested in new technology for the exploration of new oil fields, the construction of drilling platforms, or the drilling of new oil wells. (Paque, 2013) This has resulted in a situation where Russia is unable to compete with other oil production countries in terms of the exploration of future oil reserves. For example, Yukos, a petroleum corporation that once attracted many investors, tended to extract only those oil reserves that can be easily explored. In 2000, Yukos was the second largest petroleum corporation in Russia but it invested in only 22 new oil wells accounting for less than 2% of all new wells across Russia. (Qi, 2006)

The region of West Siberia is one of the main oil production regions of Russia. Currently, according to reports, around 80% of the oil reserves in West Siberia have already been explored. (Sutyagin, 2004) But with the growing demand for exports from the Asia-Pacific region, Russia now has to focus on exploiting and developing the reserves of East Siberia as well. Even if there is

promise to be found in East Siberia, a considerable amount of time and funding would need to be invested in exploration. (EIA, 2013) As a result, the progress of exploration of all fuel reserves in East Siberia is relatively slow. For example, one of Russia's largest natural gas corporations, Gazprom, is suffering from slow progress of exploration of gas reserves in East Siberia, where it has to pay a relatively higher price proportionally for the gas it is able to extract. (Anonymous, 2013) What's more, the extreme weather conditions of this region makes exploration extremely difficult. (EIA, 2013) Further to this, the lack of transportation infrastructure also seriously limits Russia's energy strategy in the long-term. There are only a limited number of pipelines in the Russian Eastern region and this may influence the exploration and development of the oil and gas fields in East Siberia and the Far East region. In order to combat this difficulty, Putin has proposed to focus on the construction of more pipelines in East Siberia in order to help boost the exploitation and exploration of reserves in the area, thereby improving the local economy and increasing export diversity. (Ivanov, 2003)

The third factor influencing the change in Russia's absolute advantage is that Russia's energy strategy involves high associated costs and investment. Many analysts believe that Russia's oil exportation cannot continue to grow, or even be maintained at the current level unless changes are made. (Hill, 2004) The European Union predicted in the year 2000 that Russia's energy sector would require investments of $460-600 billion to

ensure its long-term investment requirements. According to Telhami et al. (2002), in order to expand the oil export market, Russia will have to build large-scale deep-water ports and pipelines for the outlet of oil. However, these two types of project will require massive amounts of investment. For example, the development of Murmansk Port will cost approximately $7 billion. (Gorst, 2004) Russia also needs to continue to increase investment to upgrade existing energy extraction technologies. At the moment, Russia is still insisting on employing existing drilling technology. But without research and development of new exploration technology, Russia will struggle to maintain such high levels of production.

Finally, the European Union has been striving to reduce its energy dependence on Russia which will have a knock-on effect on Sino-Russian co-opetition. According to Monaghan (2006) the European Union is Russia's largest oil customer, importing around 50% of its gas and 30% of its oil from Russia. Indeed, Russia uses the bargaining chip of energy as political leverage when dealing with the EU. Leonard (2007) corroborates that Russia's position as a monopoly gas supplier for the European Union boosts its leverage over Europe. The higher the EU's dependence on Russia, the more Russia will benefit politically. Although as Monaghan (2006) points out, Russia and the European Union member states could use this mutual dependence to their advantage, with it helping to sustain each other's economies, the European Union continues to remain wary of Russia. Since Russia unilaterally

cut off gas supplies to Ukraine in 2006 (Barysch, 2007), the European Union has begun to minimise potential future risk by actively seeking alternative energy sources to reduce dependence on energy imports from Russia. (Monaghan, 2006) With the escalation of the EU policy, in addition to the introduction of sanctions against Russia due to Russian actions in Ukraine, Russia may be pushed into abandoning its initial strategic plan and finding a new solution, which is likely to involve increasing exports to China. In this case, China's bargaining chips will be further strengthened and the co-opetitive relations will be influenced as a result.

In conclusion, the asymmetry of Russia and China is a powerful indicator of the likelihood of success in co-opetition. The acceleration of Sino-Russian co-opetition is a natural progression caused by the continuous reduction in Russia's absolute advantage in the Dictator Game. The involvement of Japan has added a new layer of complexity to Sino-Russian co-opetition, demonstrating why a game of two players is more stable than one of three or more. Even so, China and Russia are ultimately able to engage in cooperation, which is aided by the erosion of Russia's absolute advantage. Added value in particular can help boost the likelihood of successful cooperation.

5.2.2 Added Value: Sufficient Complementarity

In terms of assumption six, in the case of China and Russia, the degree of energy complementarity is sufficiently high to achieve successful cooperation. Additionally, the sufficient complementarity also supports assumption two the interdependence between China and Russian relating to energy is not only due to the economy and strategy, but also due to geopolitical considerations. Thus, there are three dimensions of high complementarity: the balance of supply and demand, strategic complementarity, and geopolitical advantages, which include aspects such as proximity, convenience and stability of transportation, and related cost reductions for both parties.

Firstly, Sino-Russian complementarity is principally concerned with the balance of supply and demand; essentially, Russia needs to increase export diversity just as China needs to increase import diversity. This can reduce the high risk inherent in both Russia and China's energy security. Due to Russia's abundance of energy reserves, China stands to gain another choice of energy supplier. One of China's energy security issues is over-reliance on potentially risky sources such as Middle Eastern oil suppliers, and securing energy supply from Russia allows China to diversify its sources and minimise risk. Russia's Eastern Siberia Pipeline Oil (ESPO) started to export regularly to China in early 2011, at around 600,000 barrels/day. (Platts, 2011) At this point, according to the International Energy Agency (2012), 7% of China's crude oil imports hailed from Russia, 20% from Saudi Arabia, 12%

from Angola, and 11% from Iran. Although Russian supplies did not match those of China's primary suppliers in Africa and the Middle East, they still came to account for a substantial percentage after only a short while of new regular exportation from ESPO. As shown in Figure 12 below, the proportion of imports from Russia continues to increase year on year.

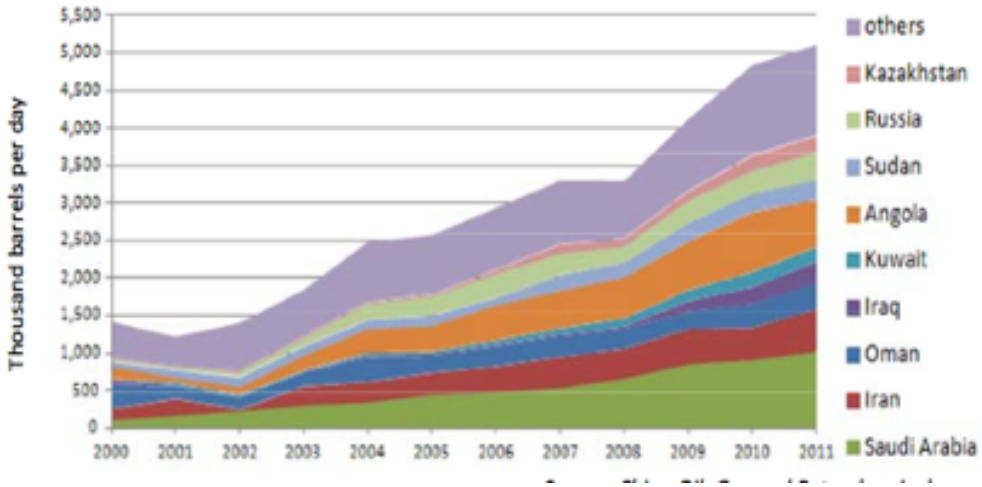

Figure 12: China's Crude Oil Imports by Source (Robison, 2012:app.1)

In Figure 13, which shows recent trends in Chinese crude oil imports, the light blue section represents Russia and the former Soviet Union countries. The fluctuation in the proportion of Chinese crude oil imports over time indicates that the important position of the Middle East is eroding, whereas the African and Russian supplies are begin to grow. Africa still maintains a higher proportion of imports than Russia, which will be discussed in further detail in Chapter Six.

Figure 13: China's Crude Import by Region, 2009 and First Half of 2010(Jiang and Sinton, 2011:12)

In addition, Russia not only supplies non-renewable fuel sources such as crude oil and natural gas, but it also provides China with assistance on some renewable energies such as nuclear power, thereby further diversifying China's energy portfolio. Moreover, the use of nuclear power instead of fossil fuels can reduce CO_2 emissions. Russia helped China build the Tianwan Nuclear Power Plant (TNPP), which began operations in 1997. TNPP is the largest Sino-Russian energy cooperation project, generating up to 14 billion kWh of electricity per year. Technology was provided by 150 Russian companies. (Russia Today, 2007) Additionally, due to safety considerations, Russia helped build another two units in Tianwan, absorbing the experience of the catastrophic Fukushima-1 nuclear accident, and accepting the strict safety checks required by post-Fukushima safety requirements. (Yemelyanenkov and Gazeta, 2013)

Although on the surface this could be viewed as a relationship of

dependence, in truth, China and Russia' energy relationship is one of interdependence, achieved due to the suitable degree of complementarity between the two states. Although Russia has the advantage of being a producer country, with the decrease in exports to the European Union, the basic target of Russian energy strategy is full integration into the world energy market, as well as maximum leverage of energy resources. (Poussenkova, 2010) According to the Ministry of Energy of the Russian Federation (2010), the long-term goal is to consolidate Russia's position in the international energy market and derive maximum benefit from this status. Within the scope of this strategy, China is an ideal location for exports due to its proximity and its ability to act as a gateway for Russia's entrance into the vast Asian market. Although Japan and South Korea are also suitable markets, close cooperation with China is favourable due to China's growing influence and reputation. As energy strategy forms the backbone of Russia's fundamental national policy, it is vital for Russia to make the wisest choices of export market.

In addition, as mentioned previously, the new level of close strategic relations between China and Russia can also prevent Russia from heading down the same road to collapse as the Soviet Union. For instance, Putin (2014) announced that Russia and China will actively use their own currencies in the energy trade, which is an important mechanism to reduce external risk. Farchy and Hille (2014) point out that the terms of the new agreement to import natural gas into China include payment in roubles. Russian companies have

also prepared for trade in Chinese yuan (*renminbi*). Considering the economic sanctions put in place against Russia by Europe and the U.S., using yuan and roubles could neatly sidestep excessive reliance on U.S. dollars. (Hudson, 2014) In addition, as Lin (2014) argues, using the two states' domestic currencies rather than the global currency can increase Russian reliance on the Chinese market. In other words, Russia needs China just as much as, if not now more than, China needs Russia.

However, a potential risk to the relationship comes from the trend in oil price decrease. With OPEC unable to rescue production, Russia may have to adjust oil prices, which could shorten the new honeymoon of cooperation between Russia and China. The possibilities for securing long-term cooperation by incorporating energy prices into mutual cooperative mechanisms will be discussed in Section 5.2.5.

Further to the crucial aspect of supply and demand, the complementarity of Russia and China's domestic strategies is also conducive to greater cooperation. For instance, Russia's 2030 energy strategy underlines the importance of the Far East market. (Ministry of Energy of the Russian Federation, 2003a) Meanwhile, the Chinese government has proposed the strategy of *revitalising the old North-East industrial base*. This plan intends to develop the North East economic area through financial support and new investments. (Zhang and Wang, 2003) Due to the close location of China's North East and Russia's Far East, these two strategies are able to work in

concert to the mutual advantage of both parties. As Xinhua News Agency (2010b:para.4) explains, in the process of revitalising the old North East industrial base, the Chinese government has encouraged the enhancement of regional cooperation and the increase of imports, which has directly resulted in the 'Program of Cooperation between the Regions of the Far East and East Siberia of the Russian Federation and Northeast of the People's Republic of China for 2009-2018.' China is also backed by its enormous labour market. With a population of 1.4 billion people, the world's largest, China is able to supply a large amount of much-needed labour to boost numbers in the sparsely populated Far East region of Russia. (Bradshaw, 2001) Cooperation in the Far East market therefore requires China to supply sufficient labour to complete cooperative goals.

The third dimension of complementarity is the geopolitical advantages of working together. China and Russia are neighbouring countries with a long border line. Energy cooperation between Russia and China, rather than with other countries, can greatly reduce the cost of energy transport both for the supplier and the customer. (Zhu, 2007) The vast majority of energy transportation between Russia and China is by railway or by pipeline. As such, Sino-Russian cooperation on these areas can save enormous costs on transportation. (Cazzola et al., 2013) As Jiang and Sinton (2011) explain, this geopolitical advantage will also improve China's overall energy security by reducing dependence on sources requiring sea transportation, which have to

navigate the risky Malacca Strait.

However, despite the geopolitical advantage of proximity, the high cost of building pipelines remains a persistent point of potential conflict between the two states. Progress on a joint project to lay a natural gas pipeline stalled for a long period of time, but as mentioned previously, in 2014 it was announced that China and Russia had finally agreed on the terms of the project and expected the pipeline to be running by 2018. This sudden push of progress hints at the pervasive reduction of Russia's absolute advantage, allowing Sino-Russian bargaining on the cost of pipelines to finally achieve success. Although Russia is still blessed with the powerful advantage of natural resources, in the context of international politics Russia has little choice but to turn strategic attention to China. But does this bode well for the stability of cooperation? The stability of the co-opetitive relationship can be greatly influenced by the establishment of reciprocity and firm commitments.

5.2.3 Rules: Well-Developed Commitments and Reciprocity

The first and foremost condition of Sino-Russian energy co-opetition is the existence of common targets. Both Russia and China put safeguarding their national sovereignty and territorial integrity at the forefront of all considerations. According to the Russian foreign policy review of 27th March 2007, the principal goal of the Russian Federation is to maintain the integrity of its

sovereignty. (Xing, 2008) Likewise, one of China's *Five Principles of Peaceful Co-existence*, which are the backbone of foreign policy, demands respect for the integrity of sovereignty and territory. This emphasis on the fundamental importance of sovereignty and territory is a shared understanding between Russia and China. In 2001, China and Russia signed the *Sino-Russian Treaty of Friendship*, a document drafted on the basis of respect for sovereignty and territorial integrity, aiming to achieve cooperation under the conditions of equality and mutual benefit. (Xinhua News Agency, 2001) With shared aims in mind, Russia and China have been able to iron out territorial disputes and have a growing relationship of trust due to mutual understanding of each other's fundamental standpoints. As we have seen in previous sections, there is no doubt that China and Russia share a matching complementarity and shared common interests, but these must be backed up with reciprocity and firm commitments.

China and Russia's current regular high-level dialogue on energy demonstrates the existence of commitment and reciprocity. Unlike Sino-Japanese discourse, Sino-Russian dialogue has ultimately culminated in action and progress, albeit slowly. Table 15 below shows the major progress on Sino-Russian energy cooperation since 2008, and demonstrates that Sino-Russian cooperation has followed the *Five Principles of Peaceful Co-existence*. The regular meetings show the gradual establishment of commitment which has resulted in successful cooperation.

Table 15: Timetable of Sino-Russian High-Level Dialogue on Energy (Researcher's own)

Time	Name	Major Content
October 2008	Sino-Russian Energy Negotiators' Meeting, First Round	Established three principles to be used as a guideline in future cooperation: 1. Comprehensive long-term cooperation 2. Market principles 3. Mutual beneficial and win-win
April 2009	Sino-Russian Energy Negotiators' Meeting, Fourth Round	Signed China-Russia Ink Oil Cooperation Agreement[39] Enhanced cooperation on oil trade and loan-for-oil
September 2010	Sino-Russian Energy Negotiators' Meeting, Sixth Round[40]	Sino-Russian joint project in Tianjin, China Strengthening cooperation on energy and new energy exploration based on the *Five Principles of Peaceful Co-existence*
January 2011		Daqing oilfield begins to receive oil from Russia (Xinhua News Agency, 2011a)
May 2011	Sino-Russian Energy Negotiators' Meeting, Seventh Round[41]	Exchanged views and plans for future energy cooperation Demonstrated mutual trust as well as candid and pragmatic spirit of cooperation

[39] Xinhua News Agency. (2009) *中俄签政府间协议 能源合作获重大突破 (China and Russia Signed China, Russia Ink Oil Cooperation agreement: An important Achievement),* Beijing: Xinhua Publishing House.

[40] Xinhua News Agency. (2010a) *中俄能源谈判代表第六次会晤举行 (The Opening of Sixth Round Sino-Russian Energy Negotiators' Meeting),* Beijing: Xinhua Publishing House.

[41] Xinhua News Agency. (2011b) China, Russia Expect Progress in Gas Cooperation. *People's Daily.* Beijing: Xinhua Publishing House.

December 2012	Sino-Russian Energy Negotiators' Meeting Ninth Round[42]	Signed a memorandum of understanding on cooperation on energy market assessment, a roadmap on cooperation in the coal sector, and an agreement on electricity supply
December 2013	Sino-Russian Energy Negotiators' Meeting, Tenth Round[43]	Cooperated not only on oil and natural gas, but also enhanced cooperation on energy saving and renewable energy
May 2014	2014 SCO Summit	Signed agreement on a natural gas pipeline to formally start to supply gas in 2018 (Xinhua News Agency, 2014)

In addition to regular high-level meetings, a series of memoranda of understanding on energy have been signed by Russia and China. A memorandum of understanding is signed on the basis of both sides' mutual understanding of circumstances and commitments and lays out concrete measures to deal with disputes. For instance, in terms of gas cooperation, Xi Jinping and President Vladimir Putin have signed a memorandum of understanding on the western gas supply route to China in 2014. (RT News, 2014) As RT News (2014) quotes, Putin announced that 'we have reached an understanding in principle concerning the opening of the western route and we have already agreed on many technical and commercial aspects of this project, laying a good basis for reaching final arrangements.'

[42] Xinhua News Agency. (2012a) 中俄能源谈判代表第九次会晤取得积极成果(Important Achievement on the Ninth Round Sino-Russian Energy Negotiators' Meeting). *Xinhua News.* Beijing: Xinhua Publishing House.

[43] People's Daily. (2013b) 中俄能源合作委员会第十次会议举行(The Tenth Round Sino-Russian Energy Negotiators' Meeting). *People's Daily.* Beijing: People's Daily Newspaper.

These memoranda are also helpful for ensuring reciprocity between the two sides. For example, according to Ifeng TV (2014), the natural gas agreement allows China to receive natural gas in return for a prepaid loan to Russia. Russia is able to secure a vital source of capital from China in the face of Western economic sanctions against Russia, and China is able to secure a steady supply of natural gas at a preferential rate, paying roughly $380-388 per thousand square metres where the average Asian price for the same quantity is $625[44]. According to Wu (2013), China's natural gas usage in 2012 has increased by 36.3% compared with 2011 and the proportion of the total relying on foreign import has reached 29%.

This case demonstrates the full understanding and reciprocity between China and Russia. Although Sino-Russian co-opetition got off to a slow start, the degree of reciprocity and mutual commitment is growing rapidly. However, it is undeniable that the progress of cooperation and the establishment of commitments have been affected by Russia's unstable policies. Although the two sides have agreed to work together following the guidelines of the *Five Principles of Peaceful Co-existence*, which entail mutual trust and respect, there have been issues over Russia's backtracking and adjustments to agreements.

[44] The price of the Sino-Russian natural gas (380-388 U.S. dollars per thousand square metres) has not been publicly announced, and Russia has said that this is a business secret. But experts have estimated the price based on what China is able to afford. (Ifeng TV, 2014:56)

For instance, Russia has made repeated changes during negotiations over pipelines. Table 16 shows specific chronological events during the long Sino-Russian cooperation over pipelines since 1994. The table shows that the negotiation period was lengthy and that the attitude of Russia was constantly in flux. It took several meetings to agree to plans which were soon marred in difficulty, and more meetings were needed to re-address the plans. It took a considerable time for China and Russia to lay out plans, but there was no obvious progress. This arduous process and constant backtracking reduces China's degree of trust and faith in Russian commitments.

Table 16: Sino-Russian Pipeline Co-opetition 1994-2011, based on 'The Events of Sino-Russian Energy Co-opetition' (CNPC, 2013)

Time	Event
1994	Russian oil company recommends the construction of oil pipelines from Siberia to North-East China
1996	Discussion on the feasibility of Angarsk-Daqing line
2001	CNPC signs agreements with Russia energy company Kukos on feasibility studies regarding the construction of the Angarsk-Daqing line
January 2003	Japan proposes the Angarsk-Nakhodka line instead of the Angarsk-Daqing line
February 2003	Russia agrees to the Japanese proposal, but decides to build a side line to Daqing
May 2003	Russia changes plans, deciding to construct the Angarsk-Daqing line after all, signing an agreement on the supply of 7 billion tonnes of oil
October 2003	Due to the intervention of Japanese

	foreign oil policy, the Angarsk-Daqing line is shelved once again
June 2004	Both the Angarsk-Daqing line and Angarsk-Nakhodka line are cancelled. Instead, construction of the Taishet-Nakhodka line is approved
June 2006	Beginning of first stage of construction of Taishet-Nakhodka line. Plans are made to construct a side line from Skovorodino to Daqing
May 2009	Beginning of construction of side line from Skovorodino to Daqing
January 2011	Russia begins to supply oil to China

In this state of diminished trust, how is it that Russia and China have still been able to succeed in cooperation? This is due to two main reasons, which have already been discussed at length. Firstly, Russia's absolute advantage is decreasing, with a knock-on effect for the likelihood of successful cooperation. Secondly, external pressure such as the sanctions placed on Russia by Europe and the U.S. has triggered Russia's growing need to cooperate with China. This high degree of complementarity has helped bolster cooperation, and the time of Russian inconsistency may be drawing to a close, but there is no doubt that the Chinese authorities will be on their guard against any resumption of Russian backtracking.

5.2.4 Tactics: Loan-for-Oil and the Laying of Pipelines

With regard to the assumption eight, there is not a specific concrete tactic to

achieve co-opetition; tactics instead depend on the player that China faces. In this case, China and Russia are asymmetrical players, but Russia's absolute advantage means that Russia will require a great deal of contribution from China. Currently, Sino-Russian co-opetition on energy falls into two styles. The first is dubbed *loan-for-oil,* which is a typical style employed by Chinese energy companies when investing abroad. According to the EIA (2014b), by the end of 2012, Chinese national oil companies (NOCs) had secured bilateral loan-for-oil deals with several countries – including Russia – amounting to around $108 billion worth of agreements. In addition, Chinese energy companies provide loans to these countries to extract energy reserves and build energy infrastructure in exchange for oil and gas imports at established prices. (EIA, 2014a) According to Jiang and Sinton (2011), in 2011 Russia signed one such deal with China, stating that in return for $15 billion in Chinese loans to Russian oil companies, Russia will supply China with large quantities of crude oil via new pipelines for the next 20 years. A 20-year deal is a relatively long period, and it will prove mutually beneficial; Russian oil companies will receive $15 billion of much-needed loans, and these companies will in turn generate 300 kb per day of energy to help meet the demands of the hungry Chinese energy market. Figure 14 is a visual representation of the structure of this Sino-Russian loan-for-oil deal.

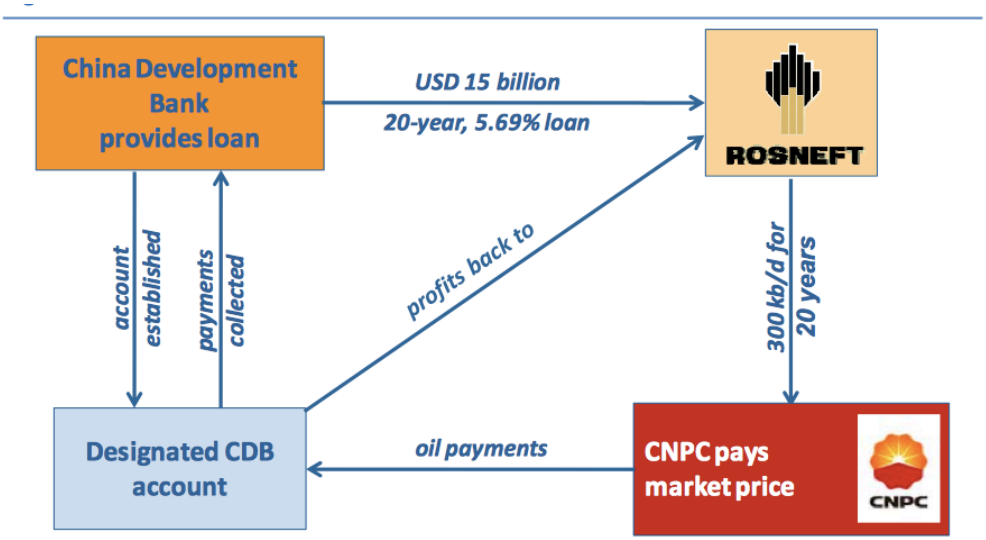

Figure 14: Sino-Russian Loan-for-Oil Deal Structure (Jiang and Sinton, 2011:22)

In addition, in the year 2013, Russian Prime Minister Medvedev signed an agreement to pump 200,000 barrels of crude oil per day over 10 years to China's Sinopec Group, in a pre-paid deal valued at $85 billion. (Dyomkin, 2013) In the same year, China National Petroleum Corporation (CNPC) and Russia's Rosneft signed an agreement to lend another $270 billion to Russia for an additional 300,000 bbl/d of oil through the ESPO pipeline. This is one of the largest energy deals that China has ever made (EIA, 2014a), and also will be decisive with regard to Russia's own future energy strategy. This kind of massive deal suggests that both China and Russia are turning their eye to the vast potential in Russian-East Asian cooperation.

In the absence of mutual trust, could this kind of cooperation, dictated by economic needs, really be stable and long-lasting? Hill and Fee (2002) note

that Russia exports primary products such as oil and natural gas to China, but China exports manufactured products back to Russia. This unbalanced trade structure directly threatens Russia's domestic manufacturing industry and runs the risk of Chinese products flooding the market, upsetting economic relations. In addition to this, although the Russian government seems to be willing to trust China, other observers are less optimistic, and China's energy threat once again rears its head. Russian political analyst Piontkovsky (2007:para.8) points out that of China's 24 neighbouring countries, 11 are engaged in territory dispute with China, and he laments that 'Russia's political and military leadership seem not to sense any threat; on the contrary, they continue to sell advanced weapons to the Chinese.'

Although these concerns cannot be overlooked, this data is already 10 years old and China and Russia had solved the boundary issues of the Hexiazi/ Bolshoy Ussuriysky Island by 2008. (Nadkarni, 2010) The successful resolution of boundary issues is in direct contrast to the escalation of Sino-Japanese conflict over territory, and may be attributed in part to the signing of the *Treaty of Good-Neighbourliness and Friendly Cooperation Between the People's Republic of China and the Russian Federation* (FCT) in 2001, which follows the outline of the *Five Principles of Peaceful Co-existence*. The treaty states that 'the two sides are determined to build the boundary between the two countries into one of permanent peace and lasting friendship. The two parties will adhere to international principles concerned and strictly

observe the boundary between the two countries.' (Xinhua News Agency, 2001)

Interestingly, the spectre of China Threat seems to now be transforming into a combined China-Russia Threat to the west due to the extensive cooperation between the two powers on energy in 2014. As Hopkins (2014:para.5) analyses, 'China and Russia can leverage the global community against the U.S. and Europe, either through vetoes at the United Nations or by using energy as a weapon.' But what exactly is the threat? If China and Japan were to reach similar agreements on energy, it is unlikely that the West would see this as a combined China-Japan threat, and may instead see Japan as mitigating China. So it would appear that the root of the issue is assumptions about the nature of Russia and China in global society. In the viewpoint of Mearsheimer (2010), China is a threat to the very security of the U.S. However, the Chinese government has consistently reiterated that the country's development will be peaceful. Closely reflecting the ideas of traditional Chinese *Hehe* culture of peace is precious' and 'harmony without sameness, in a recent speech Xi Jinping declared that 'the Chinese nation has always held such beliefs as 'peace is most precious,' 'harmony without uniformity,' 'peace among all nations' and 'universal love and non-aggression'… disputes and differences between countries should be resolved through dialogue, consultation and peaceful means. We should increase mutual trust, and settle disputes and promote security through dialogue.' (Xi Jinping, 2014:para.29)

The Chinese government has never publicly wavered from the pursuit of peace and harmony in face of different ideologies.

The second major style of co-opetition is associated with pipelines. Pipelines allow transportation of energy resources. The optimum construction of pipelines is vital to the future capacity of supply and demand. As the supplier of energy, the onus traditionally falls on Russia to construct the pipelines for energy transportation. Sino-Russian negotiations on the construction of pipelines began as far back as 1994, but construction only began in earnest in 2009. As discussed, Sino-Russian cooperation on pipelines went through a long and arduous process, and the speed of progress was somewhat hampered due to the existence of other external players, notably including Japan. After substantial cooperation, the pipeline was constructed relatively quickly, and was formally put into use in 2011. (Xinhua News Agency, 2011) The map in Figure 15 allows for the clearest understanding of Russia's ESPO (Eastern Siberia Pipeline Oil) pipeline system.

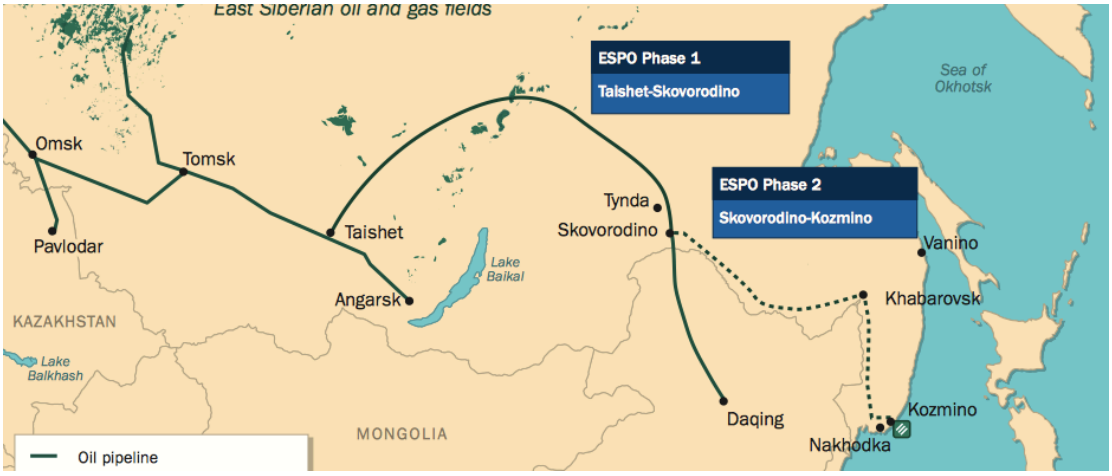

Figure 15: ESPO Pipelines Development (Platts, 2011:2)

One of the main motivations behind the construction of a land pipeline is to avoid over-reliance on maritime transport, a major risk to China's energy security. But whether the Russian pipeline is truly safer than maritime transport is still up for debate. According to Zha (2012), China's major sea transportation relies on the Malacca Strait and the possibility of war in the Strait is actually very low, because as so many countries rely so heavily on the this stretch of water, cooperation is in everyone's best interests. As for the Sino-Russian pipeline, relations are currently in a very positive stage, but if the Sino-Russian relationship were to take a turn for the worse, would the pipeline supply really be safe? It may be that the pipeline offers no more of a long-term secure solution than maritime transportation.

5.2.5 Scope: Mutual Energy Cooperation: The Best Choice for Sino-Russian Energy Co-opetition?

Finally, in terms of the assumption nine, the best scope for Sino-Russian energy co-opetition is mainly the establishment of a bilateral or mutual cooperation mechanism. Thus far, the crux of negotiation between China and Russia is almost invariably a dispute over who should bear responsibility for the price in bilateral cooperation. This includes not only pipeline projects as outlined above, but also, for instance, negotiations over the price of exporting

natural gas. The bargaining process is protracted and regularly produces little, if any, positive outcome.

With regard to bilateral bargaining over price, using the Rubinstein model, Russia and China would essentially be negotiating over how to divide the cake of energy cooperation. Both sides have a clear vision of how they can ultimately gain the greatest profit for themselves. If Russia were to put forward a price first and China agreed with this price, then cooperation could move fairly smoothly into the following stage. However, if China refuses to accept the price, then the natural next step is for China to offer their own price and await Russia's response. Once again, if Russia rejects this offer then it falls to Russia to make a new, revised offer. This back-and-forth process will last until the two sides are able to agree upon a suitable price.

This model of bargaining is slow, drawn-out, and often unsuccessful. However, the demand for energy and the need for energy exchange are still vital for both sides, and as a result, certain mechanisms are beginning to emerge to enable optimised bargaining on energy prices. For example, according to Pang (2007), the President of Kazakhstan Nursultan Nazarbayev suggested the establishment of an energy agency, or energy exchange, conducted under the framework of the Shanghai Cooperation Organisation (SCO). Following this suggestion, Sino-Russian cooperation was presented with a new challenge: establish an energy body to supervise and plan the details of energy cooperation, in order to make negotiations smoother and

more transparent. (Overland et al., 2010) In 2007, Russia announced that an SCO Energy Club would be established. This club would represent a unique cooperative decision-making centre. Energy markets in the SCO nations would be directly influenced by the SCO's energy exchange guided by the Energy Club. (Pang, 2007)

As Overland *et al.* (2010) argue, some experts believe that the establishment of this Energy Club could present a powerful opponent to OPEC, with some going so far as to describe the cooperating SCO nations as 'an OPEC with nukes.' The SCO is therefore powerful enough in itself to dictate energy prices between its members. What's more, within the SCO, there are both energy suppliers and customers. It can thus be argued that the establishment of any price-setting mechanism within the SCO will be once again dictated by the degree of complementarity of the SCO nations. In other words, as the two most powerful actors within SCO, the scope of Russia and China's energy co-opetition under the SCO will also be decided by their complementarity.

Based on Pang and Zhang (2011)'s design, the schema of establishing an energy price-setting mechanism within the SCO is complex because it includes both potential agreements and disagreements on building a price mechanism within the SCO as well as the same possibilities for using another price mechanism such as one dictated by OPEC. Eight different choices can be identified, but first there are certain considerations to take into

account. To begin with, it is supposed that if Russia does not move to prevent the establishment of price-setting within the SCO, then the mechanism will be established. However, if an energy price-setting mechanism is established only within the SCO, where China has greater leverage, China can obtain a profit of 4 (the figures are hypothesised in order to display the outcome most clearly), whereas a dissenting Russia would obtain -4. This is because Russia would be forced to make a concession on its prices. If an energy price-setting mechanism is *not* established within the SCO, but an alternative mechanism, such as that of OPEC, is taken up, then Russia stands to gain a profit of 8 due to a beneficial energy price, whereas China will obtain -2. If both sides agree to cooperate, both will receive a profit of 2, whereas if either side disagrees, the agreeing side will obtain 1, and the disagreeing side must pay the cost of betrayal at -1, as the disagreement will influence the bilateral trust-building relations between the two sides. With these conditions in mind, the eight potential choices, represented with letters, can be outlined as follows:

A: China agrees on a price mechanism within the SCO; Russia also agrees. In addition to the SCO mechanism, another price-setting mechanism is used in concert. In this situation, the profit of China is 4 (-2+4+2); the profit of Russia is 6 (-4+8+2).

B: China agrees but Russia disagrees on the SCO mechanism, and another mechanism is used instead. In this situation, China gains 3 (-2+4+1) and Russia also gains 3 (-4-1+8).

C: Both China and Russia agree to establish an SCO mechanism and do not use an alternative mechanism. In this situation, China will obtain 6 (4+2), but Russia will receive -2 (-4+2).

D: China agrees but Russia disagrees on the establishment of an SCO mechanism, and no alternative mechanism is employed either. In this situation, China obtains 5 (4+1), whereas Russia will receive -5(-4-1).

E: China disagrees on the establishment of an SCO mechanism, whereas Russia agrees. An alternative mechanism is established. Under this situation, China will obtain -3 (-1-2) and Russia will gain 5 (-4+8+1). It is specifically argued that this situation will not occur, because as a benefitting member of the SCO, it would be irrational for China to reject the profit it would gain from agreeing if Russia were also willing to establish an SCO price-setting mechanism.

F: China and Russia both disagree and another mechanism is established. In this situation, China will receive -3 (-2-1) and Russia will obtain 7 (8-1). In other words, if an SCO price-setting mechanism were not established, China would lose out in this regard and also be hit by the pressure of the alternative pricing mechanism, thereby losing out twice.

G: China disagrees, Russia agrees and an alternative mechanism is not established. In this situation, China will obtain -1, and Russia will accept 1.

H: Both Russia and China disagree, and no other mechanism is established. Under these circumstances, both Russia and China would obtain -1. These eight alternatives are laid out in the table below:

Table 17: Payoffs of Alternative Price Mechanisms (Pang and Zhang, 2011:49)

(China/ Russia)	A	B	C	D	E	F	G	H
Total profit	4,6)	3,3)	6,-2)	5,-5)	-3,5)	-3,7)	-1,1)	-1,-1)

From the analysis of these choices, it can be clearly seen that the best choice for China is to establish a price-setting mechanism within the SCO. In addition to the initial construction of an energy price-setting mechanism, questions also arise around how energy prices could be adjusted within the SCO Energy Club. As we know, Russia is the largest supplier in the SCO, but Kazakhstan also supplies oil and natural gas to China. Price adjustment will be helped and hindered by the involvement of other countries, but as the major supplier in the SCO, Russia simply cannot ignore the fluctuation in international energy prices. According to Goodrich and Lanthemann (2013), up to half of Russia's overall budget derives from two main trades: 80% of the half from oil and 20% from natural gas. Russia is thus extremely economically vulnerable to fluctuations in the price of energy. Rautava (2004) calculates that in the long-term, every 10% increase or decrease in international oil prices may give rise to a 2.2% increase or decrease in Russian GDP. As a result, if oil and gas prices fall, it

will be very difficult for Russia to maintain steady economic development. It can thus be summed up that Russia is facing a constant risk of global energy price fluctuation, as energy revenue accounts for such a large proportion of the Russian economy. Therefore, for Russia, stabilising and guaranteeing the security of the SCO Energy Club and any resulting price-setting mechanisms is a crucial issue, and the management of this challenge may influence Sino-Russian bilateral co-opetition.

In conclusion, Sino-Russian co-opetition can achieve success due to the two states' asymmetrical energy power, high complementarity, and gradually developing commitment and reciprocity. With this in mind, Sino-Russian energy co-opetition requires attention to the following aspects. Firstly, the establishment of a Sino-Russian strategic dialogue mechanism regarding energy is important for long-term cooperation. With the supervision of a strategic dialogue mechanism, these two countries will be in a better position to make full use of the favourable opportunity from their current political and economic relations, and actively work towards improving their degree of complementarity. This can enable both sides to successfully negotiate and establish an effective long-term mechanism for energy dialogue with each other.

Secondly, China must re-examine its bilateral and cooperative relations with Russia, and try to seek out multilateral cooperation that works in everyone's favour. As this chapter has shown, the involvement of Japan and

other countries in the energy game in the Asia-Pacific market has created instability for China's bilateral energy negotiations with Russia. On the other hand, the disparity of power between China and Russia is also not to China's advantage. Russia has been able to leverage its power to take absolute advantage in the energy games, pushing China into a passive position, although this is beginning to change. There is thus the possibility that carefully chosen multilateral cooperation may benefit China by re-addressing the balance of power in negotiations. However, due to current circumstances in international and regional politics, for the time being it remains unlikely that China would be able to secure a cooperative third party ally within the Asia-Pacific region.

Chapter Six: A Case Study of Sino-African Co-opetition on Energy

Chapter Five reviewed the successes and difficulties of Sino-Russian co-opetition on energy by outlining the historical development of the two countries' energy relations throughout teach Chinese leaders' era, and by conducting a game theory PARTS analysis of the possibilities for energy co-opetition between Russia and China. It was demonstrated that closer cooperation with Russia would enable access to Russia's massive energy reserves, thereby helping resolve China's major energy security concern of a shortfall of energy supply. The building of overland pipelines would also help relieve the secondary concern of risk associated with over-dependence on maritime transport. Originally, the slow and long-winded progress of Sino-Russian energy co-opetition was shaped by Russia's absolute advantage and the differing policy stances of successive generations of leadership both in China and Russia. However, with changes in the global energy pattern, the establishment of new strategic relations between China and Russia symbolises the acceleration and success of co-opetition. In the PARTS model analysis, it was deduced that the extremity of the power asymmetry was behind the initial slow progress of co-opetition; as the weaker side in Sino-Russian energy relations, China is buffeted by Russian decisions and has relatively less power of negotiation. However, within their new strategic

relations, the two countries' strategic, geopolitical and economical complementarity strengthens China's bargaining and promotes successful co-opetition. In addition, loan-for-oil and the laying of pipelines represent commitments and reciprocity, smoothing bilateral cooperation through the advancement of peaceful coexistence and mutual benefit. However, it is unlikely that complex bargaining over energy price will be resolved by bilateral cooperation, and instead it would be more efficient to find a method of multilateral cooperation, such as the Shanghai Cooperation Organisation (SCO). Nonetheless, it has also been shown that an increase in players in Sino-Russian energy co-opetition may cause swings and changes in Russia's commitment; China must therefore remain aware of Russia's interests in global energy frameworks and take this into account for China's own strategy.

In all, the current conditions of Sino-Russian energy relations represent a relatively successful case of Chinese co-opetition, but progress has been slow and difficult up to now. By comparison, Sino-African energy co-opetition has been developing at lightning speed. Africa collectively possesses vast energy reserves and in this sense is comparable to the absolute advantage of Russia. So why exactly has Sino-African energy co-opetition been so smooth and rapid compared to co-opetition between China and Russia? This chapter will focus on Sino-African energy co-opetition to investigate the precise factors influencing the success of relations.

Notably, the previous two cases have discussed China's energy relations, whereas this chapter looks at relations with an entire continent. This may appear inconsistent, but African countries have been taken as a whole for several reasons. Firstly, China has applied the lessons from the *Five Principles of Peaceful Co-existence* to various countries across Africa, and has supplied aid such as infrastructure in return for energy in the name of mutual benefit, but the exact strategy has varied slightly across countries due to different internal conditions. In terms of co-opetition, these different strategies can be treated as one large overarching strategy towards African energy-producer countries. Secondly, in this research Africa refers mainly to sub-Saharan Africa (SSA) rather than the whole African mainland per se. This is due to the complex situation in the Maghreb following the Arab Spring, including tense relations with Western powers and uncertainty about the future. In addition, according to Katsouris (2010), energy in SSA is particularly abundant, making up over half of total Africa energy reserves. Collectively, SSA countries make up a formidable energy partner worthy of analysis. Thirdly, the African countries are collectively not merely a supplier to China, but they also provide a platform for China's relations with other countries, including other African countries themselves, producer countries such as Russia, or energy-importing countries like Japan. That is to say, Africa is of great importance to China as the continent's collective energy traits match China's energy security needs, in that China's energy supply is at risk of falling short of

demand so the country needs to increase and diversify sources of energy imports. Greater levels of co-opetition with a range of African countries may allow China to conduct energy relations differently with other partners. Different African countries may benefit from co-opetition with China by playing to their own competitive advantages; as for China itself, cooperating with African countries provides access to much-needed resources, whereas maintaining a certain degree of competition protects China's own interests. Thus, for the reasons outlined above, it is rational to consider African supplier countries collectively.

As in the previous two case study chapters, this chapter on Sino-African energy co-opetition will also divide the case into two separate parts. The first will explain in more detail how Sino-African co-opetition develops by investigating why African energy is so important to China, and outlining the historical development of the relationship. The second section will move on to analyse Sino-African co-opetition according to the PARTS model from game theory, in order to deduce the way in which China currently conducts co-opetitive energy relations with African players. This section will illustrate how these asymmetrical powers play the energy game and how other players might influence the game.

The complementarity of Africa and China will also be addressed, presenting certain debates on the nature of Sino-African co-opetition, such as the argument by many Western observers that not only do China and Africa

not enjoy equal cooperation, but China even represents a neo-colonialist force on the continent. If this is the case, can Sino-African co-opetition in its present form last for very long? Furthermore, there is the persistent question of the Chinese energy threat. This generally refers to the intense competition and increased consumption of world supplies triggered by China's economic rise. It is often postulated that the world's energy structure and security will be destroyed as a direct consequence of this development. Some go so far as to suggest that China is 'plundering' the world's energy reserves. (Ministry of Foreign Affairs of the People's Republic of China, 2012) Under the shadow of the China energy threat and neo-colonialist cooperation, will it be easy for the two sides to make firm commitments? Thus far, loan-for-oil has represented China's main tactic in Africa, which has stepped on the toes of other opponent energy-importing countries. Will the situation of competition between other rivals played out on the African continent affect the trajectory of Sino-African co-opetition? Finally, the scope of Sino-African co-opetition under UNFCCC will be analysed in order to discuss whether this dialogue will be conducive to further co-opetition between China and Africa.

6.1 Sino-Africa Energy Co-opetition: Smooth but Challenged

This section will pinpoint the specific relations between China and Africa by analysing the conditions of African energy as well as the historical development of Sino-African cooperative relations. Primarily, the co-opetition between China and African has been smooth but in recent years, more and more disputes have upset the co-opetition. This includes major accusations such as the China energy threat and possible Chinese neo-colonialism in Africa, which are pejoratively affecting and calling into question the co-opetitive relations between China and African. What scope is there for Sino-African co-opetition in the future?

6.1.1 African Energy Conditions

African energy is crucial to China because it is precisely situated to resolve the major issue facing China's energy security – that current supplies may not meet demand. As discussed in previous chapters, China is desperately in need of consistent and steady supplies of energy, and one way of achieving this is through creating cooperation with new suppliers of sources previously untapped by China. African energy is especially attractive to China due to four key reasons: abundance, quality (including variety) of the reserves, low exploration costs, and favourable geographical advantages.

Firstly, Africa is one of the eight major oil-producing areas of the world, pointing to the abundance of African energy reserves. According to the International Energy Agency (2014), 30% of global oil production during the past five years has been in Africa, and this proportion is on the increase. Furthermore, statistics from BP (2013c) show that by the end of 2012, Africa's proven petroleum reserves numbered 130.3 billion barrels, or 7.8% of the world's total. The production of petroleum in Africa averages 9442 thousand barrels daily, which makes up 10.9% of total global production. However, Africa itself consumes only 3523 thousand barrels per day, a mere 4% of the world's production total. Compared to levels of production, consumption in Africa is exceptionally low, allowing a huge proportion of reserves to be earmarked for export. Figure 16 demonstrates that the proportion of proven reserves of petroleum in Africa increased from 1992 to 2012, whereas the Middle East's share was in decline. What does this suggest? It can be clearly deduced that importing energy from Africa can significantly reduce dependence on the Middle East market, which is plagued by political turmoil and instability. In terms of energy security, cooperation with Africa on energy exportation can both increase China's capability of meeting increasing domestic energy demands and relieve the current over-dependence on risky Middle East supplies.

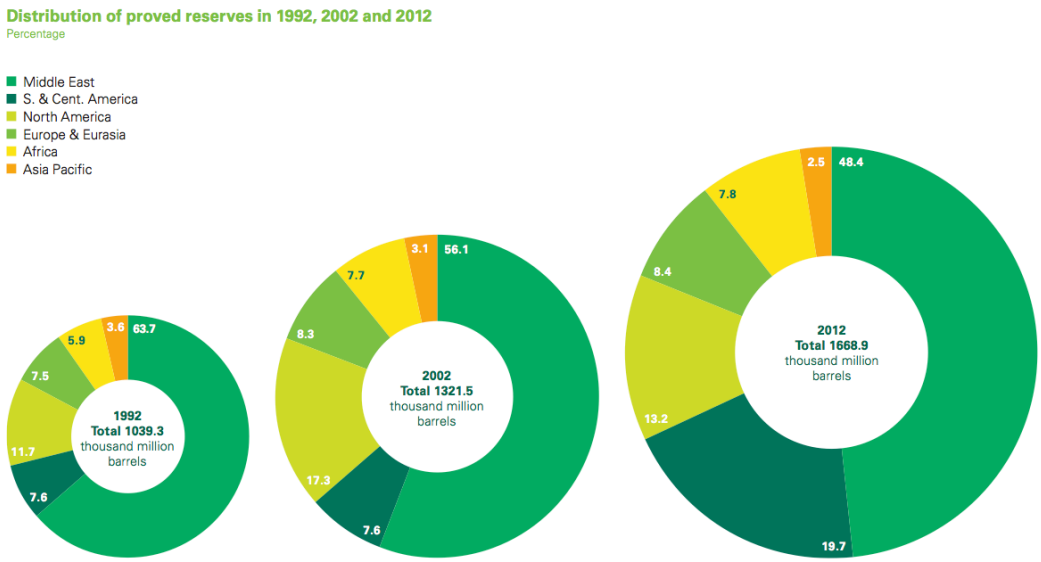

Figure 16: Distribution of Proved Reserves in 1992, 2002, and 2012 (BP, 2013a:7)

In addition to oil, natural gas is also an important energy resource found in abundance in Africa. According to a report from KPMG Africa (2013), proven natural gas reserves measured 14.5 trillion cubic metres in 2012, a 7.7% share of the global total. In addition, according to a 2013 BP report, African natural gas reserves have an exceptionally high RPR(Reserves-to-Production ratio)[45] of 67.1, whereas the world average is 55.7. (BP, 2013c) This suggests that Africa has great potential for exploration in terms of natural gas, and that it may represent an alternative partner for China to reduce reliance on Russian natural gas.

[45] RPR (Reserves-to-Production Ratio) refers to the ratio of proven reserves of fossil fuels, such as petroleum, to annual production. Generally, numbers under 10-14 are dangerous, hinting that production is plummeting and production is becoming instable. The higher the number, the longer production will meet requirements. (Feygin and Satkin, 2004)

Most African countries – with the exceptions of Nigeria, Angola and Algeria – are not members of OPEC. Non-OPEC countries are not limited by production quotas (Cline, 2008), and oil production in non-OPEC countries is largely controlled by the private sector, with production centred around the attainment of higher revenue. There is thus much greater flexibility for investment in non-OPEC countries. In 2000, more than 40 energy contracts were signed by China and African countries including Algeria, Egypt, Kenya, Morocco, Nigeria and South Africa, and many others have been engaging in continuing exploration and contract bidding. (Yang and Chen, 2005)

In addition to the abundant amount of proven reserves in Africa, foreign investment is also attracted by the extensive variety and high quality of energy resources available. For example, as Energy Intelligence Research (2009) reports, in the Republic of Guinea alone, there are more than 40 varieties of oil, most of which offer high quality crude and are easy to process and refine due to low sulphur content and mineral composition. In Nigeria, the API gravity number[46] in 65% of the crude oil is above 35. (EIA, 2012b) Most of the export crude in Nigeria is of a light, sweet grade, the gravities ranging from API 29 to 47 degrees, with low sulphur contents of 0.05% to 0.3%. (Energy Intelligence Research, 2009) By way of comparison, the average API gravity in

[46] The American Petroleum Institute (API) established a measure of the density of oil and petroleum products. Degrees API is now the most commonly used density scale. The higher the API gravity number, the lighter the crude. Crude oils with low carbon, high hydrogen, and high API gravity are usually rich in paraffin and tend to yield greater proportions of gasoline and light petroleum products. (Bacon and Tordo, 2005)

the Middle East is 31.1 and the average in Africa is 38.6. The oil in the Middle East is well-known for its quality, and yet African oil has a higher API, indicating the value of African oil exploration. (Lantz et al., 2012) Further to this, the most recent two years of BP review reports (2013 and 2014) indicate that Africa's petroleum RPR (Reserves-to-Production ratio)[47] increased from 37.7 in 2013 to 47.7 in 2014. (BP, 2013c; BP, 2014) Production rates are increasing and Africa is therefore a valuable source for China to consider.

Thirdly, although Africa's reserves are of such high quality, the costs of exploration remain significantly low, one of the major attractive advantages of the African energy market. According to data from EIA (2011b), the average cost of world oil and natural gas is $9.95 a barrel. The equivalent in the Middle East, with highly developed production, costs just US$9.89, but the African cost is only slightly higher at US$10.31 a barrel. Nevertheless, this is far lower than the US$12.18 cost in the United States, and US$12.69 in Canada. In addition, most African oil is located near the Gulf of Guinea, at shallow levels. This allows for a high rate of success in well drilling, significantly reducing the exploration costs. (Oliveira, 2007)

The fourth advantage of African energy is the favourable geographical conditions. Africa's energy resources are distributed in certain key locations, which is conducive to easy access. As Gawenda et al. (2004) mention, in 2003 alone, 30 wells were successfully drilled in Angola, Congo,

Equatorial Guinea, Gabon and Nigeria, showing the significant energy capacity across the Gulf of Guinea. The richest reserves are in West African Craton in North and West Africa.

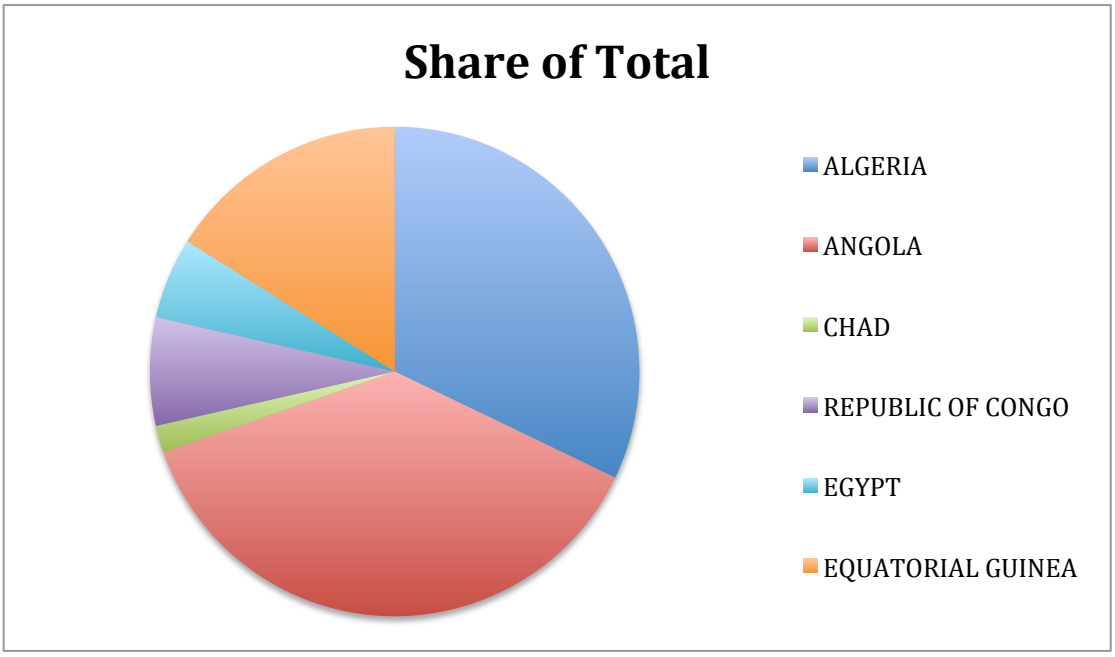

Figure 17: Production of Petroleum in Africa (Feygin and Satkin, 2004:59)

However, there is a key geographical disadvantage to Africa's energy. A third of African energy resources are distributed offshore, three quarters of which are concentrated in the Gulf of Guinea, particularly off the coast stretching from Nigeria to Angola. (Dieterich, 2004) Unfortunately, this means that maritime transportation is the optimum choice for African energy imports to China. The common import route from SSA to China is from the Gulf of Guinea through the South Atlantic Ocean, past the Cape of Good Hope into the Indian

Ocean, through the Strait of Malacca to the Taiwan Strait where imports finally arrive in China.

Figure 18: Geographical Transportation Route of China's Energy Imports from Africa (Maps of word, 2013)

Just like Middle Eastern imports, African imports to China must also pass through the infamous Strait of Malacca, increasing the risk to China's energy security. Securing the Strait is of utmost importance not only to China, but also to many other importing nations in East Asia, and so this narrow stretch is subject to coordinated patrols by Singapore, Malaysia and Indonesia (The

Jakarta Post, 2004), which somewhat increase security and reduce risk. However, many of China's remaining territorial disputes cross the China South Sea, which influences the Strait of Malacca, because as Schofield and Storey (2009) point out, it provides the shortest route between the Indian Ocean and South China Sea. Territorial disputes reduce the likelihood of coordinated security efforts and increase instability and risk, so for the sake of energy security, China may need to turn attention to securing the Strait.

Due to these four advantages, African energy is undoubtedly an interesting proposition for China, and the significance China places on securing a new supplier of energy strongly influences the inevitability of increasing interdependence between China and Africa. So how exactly have Sino-African relations developed over time?

6.1.2 Historical Development of Sino-African Energy Relations

Generally speaking, Sino-African co-opetition has been smooth and free from the hiccups seen with Sino-Russian co-opetition, or the rivalry that besets Sino-Japanese relations. Chinese *Hehe* culture has been a major influence in Sino-African relations, with China extending support to Africa since the very beginning of Mao's era in the name of mutual support. Today's Sino-African co-opetition has grown from virtually nothing; Sino-African relations began with unilateral aid flowing from China to Africa and have metamorphosed into

co-opetition with the discovery of African resources and the acceleration of China's energy security concern.

Naturally it can be questioned whether China's co-opetitive efforts are truly sincere; Sino-African co-opetition has so far been driven almost entirely by rapid energy exploitation financed by China, creating sometimes runaway profits for Africa and possible risk to Africa's balanced development. According to Taylor (2006a), China's vast investment in Africa in the relentless quest for energy is seen to prop up autocratic and corrupt regimes, causing yet more disputes about the goal of China's energy programmes.

However, considering historical developments, this chapter argues that China's co-opetition with Africa is a reasonable evolution of the previous aid-based relations, built upon the principle of mutual benefit and mutual respect for both sides. Although it takes an economic form, this does not mean that the motive behind co-opetition is necessarily based purely on economic profit, but rather it is still influenced by *Hehe* culture, the *Five Principles of Peaceful Co-existence*, and the gradual progression of mutual understanding between partners. The nature of cooperation has never changed; China has long supported Africa, but the existence of energy complementarity has injected new life – and greater equality – into Sino-African relations. Here, as assumption ten [48] mentioned, *Hehe* culture made the co-opetition with

[48] Assumption Ten: *Hehe* can keep the balance in co-opetition and compensate for the add value on economy interdependence. (Details have been examined in section 2.1.3)

Chinese character and restored the limitation of purely economic complementarity.

Relations between Africa and New China began in the era of Mao, who proposed his three world theory: the first world of superpowers, the second world of lesser powers, and the third world of exploited countries. Mao believed that the oppressed people of exploited countries should strive for liberation, and that if they were unable to do so themselves, it was the responsibility of successfully liberated countries to offer their assistance to those still struggling to foment revolution. Mao (1977a) considered this to be nothing less than an international socialist duty. Although this Maoist thought has been criticised, it was generally framed as an altruistic attempt to support those in need, including in particular the underdeveloped post-colonialist countries of the African continent and elsewhere. For example, in 1959, China supplied 10,000 tonnes of rice to Guinea and 15,000 tonnes of wheat to Albania. (Ogunsanwo, 1974) As Figure 19 shows, even though 1960-1963 was a period of natural disaster in China, and failed industrialisation schemes were causing havoc nationwide, China's aid to Africa was still rising.

What's more, Figure 19 also shows that 1973 was the first peak year of aid to Africa – but in 1973, China itself was mired in the ten year Cultural Revolution (1966-1976). Economic recession was rampant and industrialisation had ground to a halt. (Bai, 2014) But until 1973, China's aid to Africa continued to rise unabated. This does not seem to be a particularly

practical or rational undertaking, and indeed levels of aid did drop dramatically as China's economy reeled from the effects of domestic political change. Nonetheless, until no longer able, China supplied aid to Africa based on *Hehe* culture, which emphasises cooperation and harmony between countries.

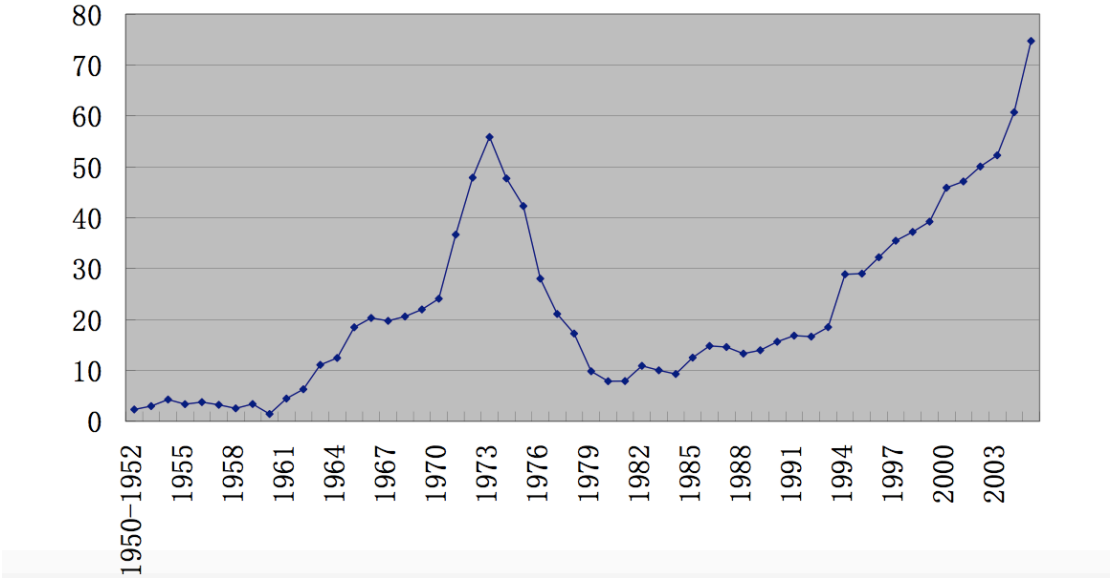

Figure 19: China's Foreign Aid to Africa (RMB) (Li, 2006b:2)

In the early 1950s, the Chinese government started pursuing the *Five Principles of Peaceful Coexistence*, followed by the *Eight Principles for Economic Aid and Technical Assistance*[49] proposed in 1964 to dictate policy

[49] These principles were proposed by Zhou Enlai in 1964, and include the following eight points

1. Be based on the principle of equality and mutual benefit
2. Respect the sovereignty of recipient countries and never attach any conditions or ask for any privileges
3. Provide economic aid in the form of interest-free or low-interest loans and extend the time limit for the repayment when necessary
4. Help recipient countries embark step-by-step on the road to self-reliance and independent economic development
5. Help recipient countries complete projects which require less investment but yield quick results
6. Provide the best quality equipment and materials manufactured by China at

toward Africa as a whole. (Lu, 2000) These principles underline the equality between the two actors, the Chinese government's respect for Africa, and the desire to employ complementary advantages in order to achieve mutual benefit. Crucially, as Zhou (1964) points out, all aid was provided without any attached conditions, and was therefore based on equality and mutual respect. In other words, although aid was provided unilaterally, China saw the fundamental relations between China and Africa as mutual, and gifted aid on the basis of respect for an oppressed partner. Zhou (1964) also notes that the major objective of Chinese aid was to help boost the self-reliance of the recipient by transfer of capital, experience and technology. Thus, although the levels of aid in Mao's time were irrational and surpassed China's capacity, they derived from a principle of sincerity.

It is important to note that, as Li (2007) explains, although China offered assistance to Africa, formal cooperation existed only between a few limited countries, particularly those fighting for the communist ideology, including the African National Congress (ANC) in South Africa, and Guinea and Cape Verde. China particularly supported countries which had broken with the Soviet Union. As such it can be seen that although China's aid was based on mutual respect, it was only extended to countries with shared ideologies as

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international market prices

7. Ensure that the personnel of the recipient country fully master the technology being transferred
8. Chinese experts will have the same standard of living as the experts of the recipient country (MOFCOM, 2009)

part of China's assumed international duty to assist the socialist liberation of the third world.

As China's political stance changed at the dawn of Deng Xiaoping's era, aid began to drop dramatically. China was engaged in restructuring its own economy and irrational aid for the sake of ideology was no longer a realistic possibility. According to the Modern Chinese Research Institute (1977), in 1950-1976, China had already spent 44.5 billion yuan on foreign aid, and had signed aid agreements totalling 61.9 billion yuan. It was decided that future foreign aid should be in proportion to total expenditure, and be limited to only 4% of the amount, in order to reduce underdeveloped countries' reliance on Chinese aid.

Furthermore, China still requires considerable funds to develop its own economy, and due to the damage caused by the Cultural Revolution, the government has little choice but to reduce aid expenses in order to make up for the shortage of capital. (Zhou, 2014) However, although the amount of aid expenditure decreased in Deng's era, this does not mean that China abandoned aid to Africa in entirety. According to the Ministry of Commerce of the People's Republic of China (1985), the Chinese government instead focused on medical and educational aid to Africa. For example, medical teams were dispatched to 45 countries in 1984 alone, treating around one million patients. As the Chinese economy slowly began to recover, aid to China also crept up from 1982 onwards.

Another significant change occurred in Deng's era: China began to offer aid to countries with different ideologies, such as Egypt. (Shu, 2010) In this way, it can be seen that the aid structure under Deng Xiaoping was even more closely aligned with the ideas of *Hehe* culture, particularly *harmony without sameness*. The goal of Sino-African co-opetition in the Deng Xiaoping era was to help African countries stand on their own two feet, rather than rely on others, regardless of ideological differences. Even as China moved on politically from Mao's ideological stance of international socialist duty, traditional *Hehe* culture still encouraged the continuation of aid for the sake of mutual respect and benefit. The government had also conceded the importance of respecting China's true capabilities and needs, and although cooperation at this point was still almost entirely limited to aid, this concession marked the beginning of embryonic co-opetition.

As Figure 19 shows, from 1993 onwards, aid spiked again. In the context of China's energy security, this increase in aid was inevitable. According to Ma (2006b), China became a net crude oil import country in 1993, and African energy was poised to develop. Before 1979, China's earliest policies in Africa focused mainly on agriculture, with very low amounts of investment. (Gillespie, 2001) The period from 1979 to 1990 showed the beginnings of growing investment plans, and after this point, due to China's specific energy security requirements, cooperation with Africa accelerated. Since 1991, the first stop of China's foreign ministry official visits every year

has always been Africa. The fact that Sino-African relations have been driven by energy has caused many observers to question the sincerity and nature of China's aid and investment in Africa.

However, there has been no real change to the nature of China's aid to Africa. According to the Information Office of the State Council of the People's Republic of China (2011a), China's foreign aid continues to be offered without any associated conditions, and China provides reciprocal loans and aid in many different areas, such as support for medical services, education and infrastructure. 28 countries have established political consultation mechanisms with China and cooperation with these countries entails an increasing number of fields, particularly education and health. (Thompson, 2005) China also supplies technology to Africa to develop clean energy and reduce environmental pollution. In a 2011 government white paper on foreign aid, it was reported that in the past 10 years, China has transferred advanced clean energy technology, including wind and solar, to Africa and other developing countries, and has held 50 training courses, with 1400 experts attending the training. (Information Office of the State Council of the People's Republic of China, 2011a)

The Chinese government has also noticed the importance of multilateral organisations for balanced cooperation, including the

establishment of the Forum on China-Africa Cooperation (FOCAC) in 2000[50]. The framework of FOCAC can significantly improve understanding on both sides and push cooperative efforts in a manner beneficial to both parties. Due to the large number of Africa states, China has also signed bilateral joint declarations with different countries. For instance, an agreement signed with Ethiopia on 6th May 2014 reiterates the significant progress that has been made since the formal establishment of Sino-Ethiopian relations in 2003, and emphasises the importance of maintaining peaceful cooperation in Africa through continuously increasing understanding under the principles of mutual benefit and respect. This declaration also noted the importance of FOCAC in shaping Sino-African cooperation. (Ministry of Foreign Affairs of the People's Republic of China, 2014b) China and Kenya also signed a joint agreement in 2014, with similar content, including the importance of the existence of FOCAC in pushing Sino-African cooperation work in different fields, such as education, technology and energy. (Ministry of Foreign Affairs of the People's Republic of China, 2014c) Outside of such bilateral agreements, the framework of FOCAC treats African countries as a whole, which is convenient for China's application of the principle of *harmony without sameness* although the countries are different, this forum allows China to maintain positive, harmonious relations with the member states as a whole, without discrimination.

[50] The objective of the Forum on China-Africa Cooperation (FOCAC) is: 'Equal consultation, enhancing understanding, expanding consensus, strengthening friendship and promoting cooperation.' Five Ministerial conferences have been held within the forum thus far. (FOCAC, 2013)

China's aid has transformed from pure aid in the early era of Mao to the modern age of co-opetition. In addition to bilateral co-opetitive agreements, multilateral organisations such as FOCAC also shape Sino-African co-opetition, collective relationships based over time on the principles of deep understanding, mutual benefit and respect seen in traditional *Hehe* culture. Although the format of China's relationship with African countries has evolved over time, the nature of Sino-African cooperation historically began with mutual respect, and the inclusion of energy trade in the relations does not defeat this principle, but rather allows Africa to act as a more equal partner with China.

Nevertheless, this is the way that Sino-African co-opetition has been framed by China, the context of Africa's colonialist past cannot be ignored. It is this context that raises external concerns about the nature and motivation behind China's actions, which have been labelled neo-colonialist by many observers. The idea of China energy threat also comes into play as rival countries see China's extensive presence in Africa as a threat to their own energy security. Will these issues influence co-opetition between China and African countries? The following section will apply the PARTS model of game theory to investigate this riddle.

6.2 Sino African Co-opetition under the Model of Game Theory

Sino-African co-opetition is different to the previous two cases, because the co-opetitive environment for China and Africa is much more complex. In addition to the fact that many African countries have been treated collectively in this research, additional players such as the U.S., the European Union, Japan, India and Russia have all brought their energy ambitions to Africa, influencing the Sino-African game of energy co-opetition. The objectives of these third players will be discussed in turn, but the main PARTS analysis of Sino-African co-opetition will be compared principally to Sino-Japanese and Sino-Russian co-opetition in order to tie the three cases studies together.

6.2.1 Players: Asymmetrical Power in a Complex Environment

The first section concerns the players in the Sino-African game of energy co-opetition, and debates how asymmetrical power within a complex environment of complementary advantage affects the prospects of commitment to co-opetition, in particular when faced with the aforementioned risks of China energy threat and neo-colonialism.

Due to the abundant reserves of African energy, the continent is rapidly growing into an intense market not only for China, but also for other actors around the world. In other words, in terms of the co-opetition for

resources on this platform, China is pitted against rivals, which include not only African countries themselves, but also other actors. China and Africa are asymmetrical powers in terms of energy, and as discussed in assumption five a relationship of asymmetry is conducive to successful co-opetition. Unlike the unsteady pace of Sino-Russian co-opetition, Sino-African relations have been expanding relatively smoothly. In 1992, China's oil imports from Africa were as low as $0.77 hundred million, accounting for only 4.49% of China's total oil imports. Since then, imports from Africa have increased year on year. By 2008, China's crude oil imports from Africa reached $38.944 billion, making up 30.11% of total imports. Following the global financial crisis of 2009, imports from Africa dropped to $27.127 billion in amount, but the proportion actually increased by 0.28% to 30.39% of the total. (Liang, 2011) These statistics point to the growing importance of Africa to China's energy structure, revealing that the degree of China's dependence on African oil is increasing continuously.

In other words, African energy now also has absolute advantage in the game. In addition, as in the Dictator's Game, with absolute advantage Africa also has the ultimate say on decision-making over the allocation of gains. China does not have the power to control the final decisions of Africa. And yet, the results of the Sino-African game differ from those of the Sino-Russian game. Why is this?

In the energy game, in terms of resource asymmetry, China is P while Africa is Q, and Q>P+5. (The abundant reserves of African energy dictate that

Africa has more advantage than China, and therefore Africa's position can be represented as P+5). Africa has more flexibility to influence absolute gains, as shown below in Table 18.

Table 18: Payoff Matrix of Sino-African Co-opetition

	Africa (Cooperation)	Africa (Defection)
China (Cooperation)	(4, 5)	(1,6)
China (Defection)	(5,1)	(2,2)

(1)When both players chose cooperation, Africa is able to obtain more interest than China due to its relative power. In other words, the relative gain that Africa can obtain is 1 more than China. In addition, due to different energy requirements, China is on the hunt for energy whereas Africa is exporting energy. Thus any interest that Africa obtains will not influence China's interest.

(2)When both players choose to defect, both can obtain 2. The reason that the gain is not 0 is because there are other players in the game. In other words, even if China does not purchase energy from Africa, there are other players who will; in turn, China will still buy from another channel. This outcome will not influence relative gains.

(3)When one of the two defects, the situation becomes more complex, particularly if both sides wish to produce long-term cooperation. If in one round, Africa chooses to defect, China would obtain -5 relative gains, which can

damage long-term cooperation. Thus, in this case strategies would have to be changed to achieve success under a repeat game to enlarge absolute gain.

This demonstrates that from the beginning of Sino-African energy co-opetition, Africa has had the good will to cooperate with China, as cooperation could not have been produced under the circumstances of extreme asymmetrical power unless Africa chose not to defect. This is markedly different to Sino-Russian energy relations, where China has been at the whim of Russia due to the asymmetry of power. In other words, this payoff matrix highlights Africa's sincerity in cooperation in comparison to Russia's somewhat fickle approach.

One key factor is that although China and Africa are asymmetrical in terms of energy, with Africa holding the absolute advantage, this is not the case in other fields. First and foremost, China's economy is far more advanced than SSA. According to Trading Economics (2014), Africa is suffering a serious debt crisis and an average of 46.1% of GDP is used to pay this debt. Angola, a country with huge amounts of natural energy resources, has a lower level of debt at 29.29% of GDP, but even this is far higher than China's 22.4%. Thus, taking the average of African countries includes both countries that are relatively more successful than the average like Angola, as well as other countries with far deeper levels of debt. Thus, in terms of economy, there is a massive gap between China and Africa, and power is asymmetrical in China's favour. Chapter Two explained that energy security is closely related to the

economy. According to Keohane and Nye (2011) economic interdependence drives cooperation in other fields. Is this the case with Africa and China, or is it instead that energy cooperation is conversely driving economic interdependence? This will be discussed further in terms of added value in Section 6.2.2.

Co-opetition between China and other countries within Africa is another inevitable influence over the result and progress of Sino-African co-opetition. Many other countries have been showing significant interest in Africa due to its abundant energy production capacity, and have taken a series of actions to gain a foothold on the African energy market. In this sense, China has many opponents in the battleground. Table 19 shows the total energy imports and exports of various countries and regions such as the United States, Europe, China, India and Japan, revealing that imports are significantly greater than exports in many cases. Like China, these countries have to chase fixed energy markets. China is thus faced with many opponents in the race to secure African energy, and must take positive action to cooperate with African countries whilst simultaneously balancing relations with other competitors in the African market.

Table 19: Global Imports and Exports 2012 (BP, 2013a:19)

Imports and exports 2012

	Million tonnes				Thousand barrels daily			
	Crude imports	Product imports	Crude exports	Product exports	Crude imports	Product imports	Crude exports	Product exports
US	424.0	100.5	1.1	127.5	8491	2096	23	2657
Canada	25.7	10.1	121.7	29.7	514	211	2437	619
Mexico	†	27.9	64.4	3.7	‡	581	1290	76
S. & Cent. America	19.6	67.7	156.9	33.1	392	1411	3143	691
Europe	474.9	142.8	19.1	85.9	9512	2976	383	1791
Former Soviet Union	†	5.5	302.0	122.2	‡	114	6049	2548
Middle East	11.1	26.8	881.1	98.5	222	559	17646	2053
North Africa	9.3	15.0	106.8	22.3	186	312	2139	465
West Africa	†	11.4	216.1	11.3	‡	238	4328	235
East & Southern Africa	14.2	12.5	4.3	0.7	285	260	86	15
Australasia	28.7	18.2	13.6	7.9	575	379	272	164
China	271.3	83.0	1.3	25.8	5433	1729	26	538
India	177.1	15.5	†	64.7	3547	323	‡	1349
Japan	186.7	48.2	†	10.6	3739	1004	‡	221
Singapore	47.3	96.7	0.6	71.0	948	2016	12	1479
Other Asia Pacific	237.4	120.2	38.3	87.0	4755	2505	767	1813
Total World	**1927.3**	**801.8**	**1927.3**	**801.8**	**38599**	**16715**	**38599**	**16715**

†Less than 0.05.
‡Less than 0.5.
Note: Bunkers are not included as exports. Intra-area movements (for example, between countries in Europe) are excluded.

One of the strongest players in the African market is the United States. As shown in Figure 20, in 2011 U.S. imports from Africa accounted for 10.3% of total oil imports, whereas the Persian Gulf represented 12.9%. In other words, the U.S. dependence on Africa is nearly equal in importance to that of the Middle East.

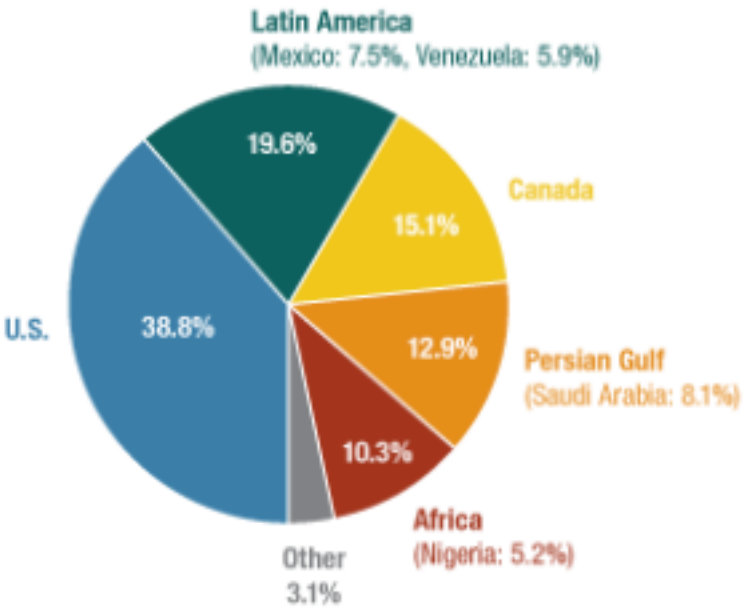

Figure 20: Where does the U.S. get its oil? (Flintoff, 2012:app.1)

Figure 21 shows that of the top ten countries importing to the US, three are from Africa, namely Nigeria, Algeria and Angola. Nigeria and Angola belong to SSA. Imports from Nigeria are a little lower than those from Saudi Arabia, but higher than those from Venezuela, another growing producer country.

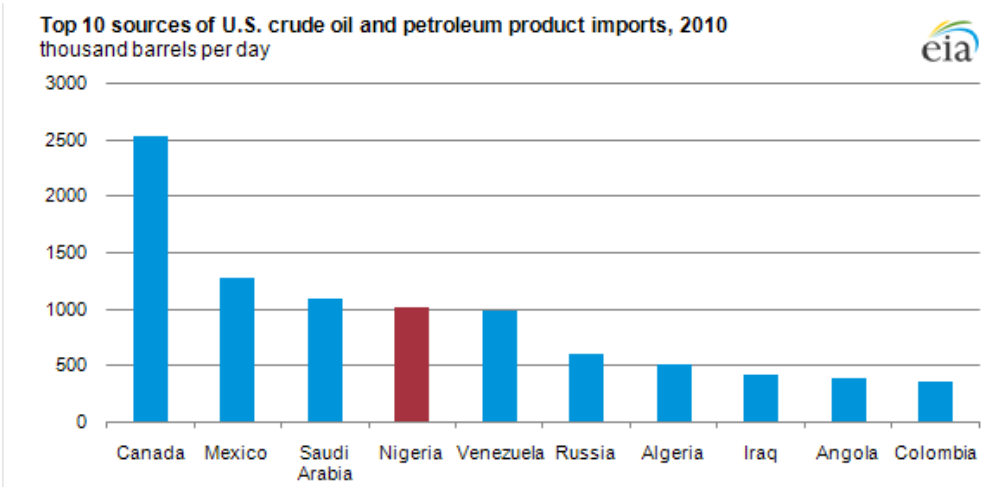

Figure 21: Top 10 Sources of U.S. Crude and Petroleum Product Imports 2010 (EIA, 2011a)

The reason behind the large amount of energy imports from Africa is related to the long-term U.S. energy strategy. According to the U.S. National Security Strategy of 2002, in terms of United States' involvement in Africa, improving cooperation with African energy-producer countries is an important method of relieving the U.S. energy situation. (National Security Council, 2002) In order to guarantee cooperation on energy trade, the United States has focused on different aspects, particularly foreign policy. Since 2002, the American Secretary of State and other senior government officials have frequently

visited Africa, and President Bush not only visited in Africa in 2003, but also met with African energy-producing countries' leaders during the United Nations General Assembly meeting. (Niu, 2008) The U.S. approach advocates a humanitarian plan to build up the infrastructure of democracy, significantly different to the Chinese foreign policy toward Africa. The U.S. government standpoint is that the rich rewards from Africa should be based on human rights protection and effective government regulation, which should be followed by institutionalisation of political and economic reforms. (Schutz and Wihbey, 2001) The National Security Strategy maintains that long-term cooperation with Africa should be built upon trust, which can be reinforced through the establishment of infrastructure, education and health to improve governance and the quality of life. As a result, 'the United States will increase its own funding for education assistance by at least 20 percent with an emphasis on improving basic education and teacher training in Africa. The United States can also bring information technology to these societies, many of whose education systems have been devastated by HIV/AIDS.' (National Security Council, 2002:para.12) Consequently, cooperation between the U.S. and Africa carries many additional conditions, in particular the establishment of a reasonable and controllable management mechanism for the exchange of African energy.

China and the U.S. have taken different approaches to supporting Africa, and although the U.S. attaches conditions to aid, ultimately the targets

and fields of aid are noble and of vital importance to Africa's balanced development. In this sense, particularly when considering the possibility of the China energy threat, would humanitarian U.S. aid edge out China in Africa? Some even debate whether the United States should ally with other players in order to resist the encroachment of China in Africa. (Schaefer, 2006) In addition to the U.S., other international players have also used the humanitarian aid playing card to engage with Africa and secure access to energy supplies.

For example, Japan is the world's second largest economy; it is also the third largest energy consumer, third largest petroleum importer, and the largest natural gas importer in the world. (EIA, 2012a) However, in contrast to the United States and European countries, the Japanese government tends to avoid politics, highlighting economics in its energy cooperation with Africa. The Japanese government provides economic aid in an attempt to improve relations with Africa. By 2007, Japan had provided aid to 27 African countries, with 48 projects (including loans and debt relief) equal to $2.88 billion. (Yu, 2008) These efforts seem to have obtained the desired results: in February 2005, Japan signed a cooperation agreement with Egypt, winning the exploration rights in the central Gulf of Suez, producing more than 5000 barrels daily from mid-2007. (Kuwait News Agency, 2005)

Nonetheless, in recent years, Japan has begun to show interest in the *aid for resources* approach, providing financial and technical assistance

and subsidies for resource development projects in exchange for stable energy supplies in Africa. For example, former Japanese foreign minister Maehara Seiji clearly indicated that Japan had the desire to promote bilateral relations when he visited Algeria in December 2010, based on a plan of assisting Algerian economic development in exchange for the country's oil resources. (Anonymous, 2010) In sum, Japan's plan for energy cooperation in Africa is based largely on economic aid, in order to guarantee energy supplies.

Different players play different roles in Africa, each with their own aims and schemes, and the competition is more intense for China than ever before. As a result, faced with the pressure of humanitarian and supervised co-opetition conducted by the U.S. or the considerable economic support from Japanese-African co-opetition, what advantage can China offer? In fact, this question also returns to the original question of the section: why has Sino-African co-opetition developed so smoothly despite Africa's absolute advantage in the game? The answer seems to lie in the high degree of economic complementarity.

6.2.2 Added Value: Intense Economic Complementarity

According to a government white paper, China has become Africa's largest trade partner, and Africa is now China's major import source, second largest overseas construction project contract market and fourth largest destination for

investment. (Information Office of the State Council of The People's Republic of China, 2013b) According to Schaffnit-Chatterjee (2013), Africa's economy grew by 5% in 2013, which is higher than expected, and hints at the possibility for complementary trade between China and Africa. Figure 22 shows that from 2000 to 2012, the total volume of Sino-African trade continuously increased, including both China's exports to Africa and imports from Africa. Further to this, in 2013, President Xi Jinping promised to allow a further $200 billion in loans to Africa in the next three years. (People's Daily, 2013a) This trade balance shows the success of Sino-African co-opetition, but according to Hai (2013), the Chinese public misunderstands the nature of this large loan and many consider it a waste of money. The huge amount of money also raises comparisons to Mao's irrational aid to Africa when China simply could not sustain such levels of foreign aid. Although the Chinese economy is the second largest economy in the world, there is a large gap in the per capita GDP compared with developed countries such as the U.S. (Yueh, 2014)

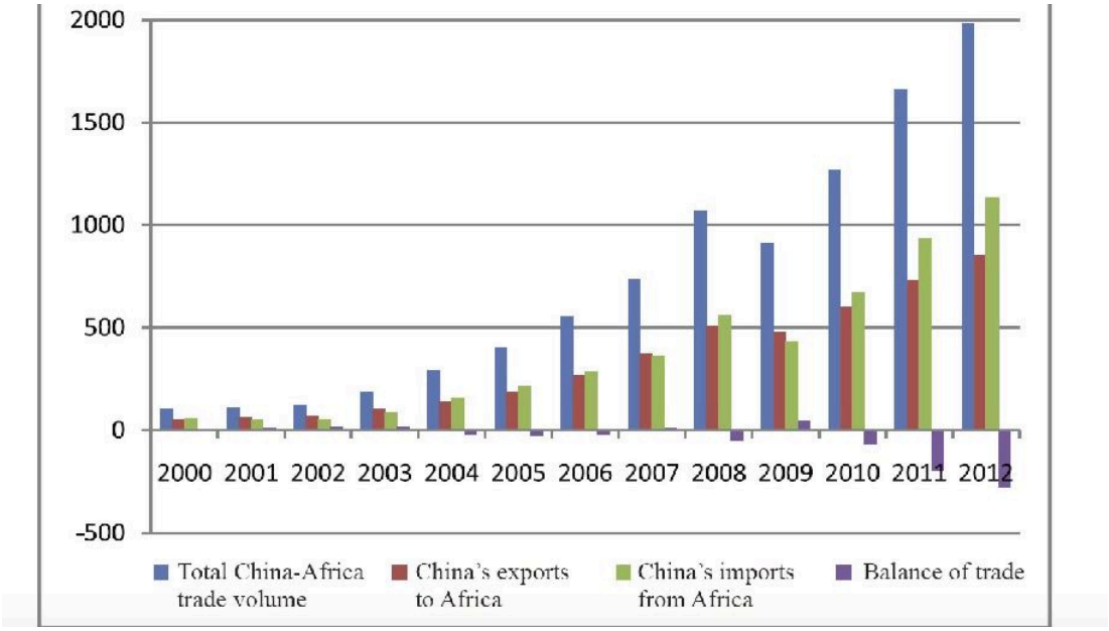

Figure 22: China-Africa Trade Volume (2000-2012) (Information Office of the State Council of The People's Republic of China, 2013b:I)

In fact, the rationale behind the provision of this loan is very straightforward. Like many countries in other regions of the world, the most common difficulty plaguing African economic development is the persistent lack of funding, meaning that many promising developmental policies and important projects cannot be brought to fruition. To combat this, international organisations such as the IMF, World Bank, the Islamic Bank of Africa, and the African Development Bank have responded positively by providing development capital to African countries. China's promise of loan provision to Africa shares the same objective of supporting African economic development – which will in

turn benefit China in terms of increasing trade volume. (Ministry of Foreign Affairs of the People's Republic of China, 2014a)

In addition to this loan-for-oil tactic, direct investment in Africa is also growing. In the Fifth Forum of the China-Africa Cooperation Ministerial Conference, Yang Jiechi, China's former Minister of Foreign Affairs, mentioned that, by the end of 2011, direct investment in Africa had reached $147 hundred million, with over 2000 enterprises investing in Africa. Figure 23 demonstrates that mining is currently by far and away the main field attracting Chinese investment in Africa. This immediately raises China energy threat concerns, with China dominating cooperation with Africa purely for the sake of securing energy supply.

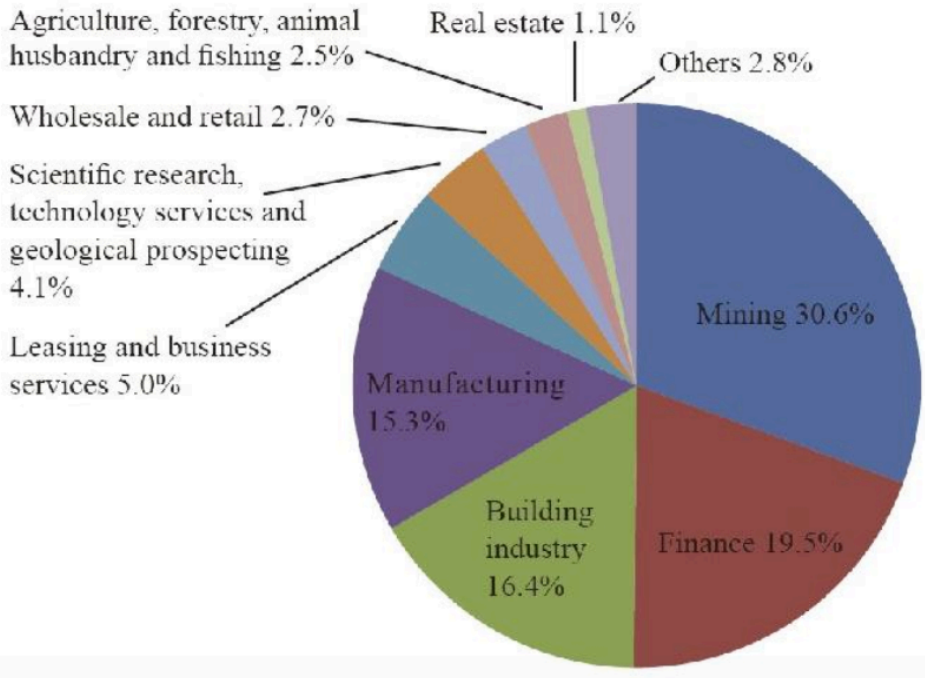

Figure 23: Distributions of Chinese Direct Investment in Africa (up to end of 2011) (Information Office of the State Council of The People's Republic of China, 2013b:II)

However, China stresses that in terms of scale and quality, China's energy cooperation with Africa is radically different to that of European and North American countries. In 2008 China's foreign ministry spokesman, Jiang Yu, pointed out that 79% of Africa's oil is used for exports, and of this total, 36% is imported by Europe, 33% by the United States, and just 8.7% by China. Thus by comparison to other large global actors, China's far smaller stake of the total can hardly be regarded as predatory. (China News, 2008) Zhai Juan (Assistant to the Director of the Ministry of Foreign Affairs African Affairs Department), responding to questioning by journalists, stressed that whilst energy cooperation is vitally important, it is not the whole picture of Sino-African cooperation. Instead, evaluated impartially, it is merely an extension of the traditional relations between China and Africa and is in accord with both sides' interests. (China News, 2009) In addition, foreign ministry spokesman Liu Weimin argued that not only did energy cooperation not represent the full extent of Sino-African cooperation, it was also not the starting point of China's foreign policy toward Africa. (FMPRC, 2012)

Ma (2006b) also refutes the concept of China energy threat, stressing that China is making full use of its own capacities to help relieve its energy issues, and that this does not represent a threat to other countries. He goes on to elaborate that China has been able to solve energy issues on the basis of its own strength, and that China is not only a consumer, but also a producer of energy. What's more, in China's energy structure, coal accounts for 67.7%, but

oil for only 22.7%. The structure reflects China's rich domestic coal reserves, thus prioritising coal as far as possible in order to guarantee domestic sources of energy supplies. In other words, only considering China as a rapacious consumer of energy is a one-sided argument, as China is also a strong producer of the largest part of its energy resources. Furthermore, a government white paper on energy also emphasises that China will rely most of all on domestic sources of energy; entering into the international market is a method of relieving the environmental pollution pressure caused by coal, as well as providing support for economic development. (Information Office of the States Council, 2012)

In addition to this, in the BP report *Energy Outlook 2030*, the growth in global energy consumption is declining, down from the yearly 2.5% growth rate recorded over the past decade to an annual average of 2% over the next ten years, and a further reduction to 1.3% from 2020 to 2030. Moreover, energy use intensity is predicted to decrease by 2030 – including in China – due to the development of new clean energy and shale gas. This report suggests that although China's expected demand growth in 2030 will account for roughly half of new global demand, this demand can be met, and does not represent a threat to overall world energy. (BP, 2012a)

In conclusion, the degree of Sino-African economic complementarity is particularly high, but complementarity in other fields is not high enough. After the honeymoon of Sino-African economic complementarity, can co-opetition

continue to last? China's asymmetry is balanced in large part by the high degree of economic complementarity, but this situation is not multifaceted enough to be truly stable. If economic complementarity develops out of kilter, this will likely upset the balance of Sino-African co-opetition. Establishing commitments may be one way to redress this issue.

6.2.3 Rules: *Hehe* Culture Puts Neo-Colonialism to the Test

Complementarity itself is not enough to ensure the success of co-opetition. Another vital aspect is the creation of firm reciprocal commitments, and neo-colonialism is the key debate influencing the establishment of commitments in Sino-African co-opetition. As (Barnwell, 2011) states, this inevitably leads people to question, is this now China's Africa ? Additionally, a special report carried about by Behar (2008:para.7) states that 'this commercial invasion is without question the most important development in the SSA since the end of the Cold War – an epic, almost primal propulsion that is redrawing the global economic map.' Africa has been labelled a new Chinese colony in common parlance. China no doubt invests huge sums of money into the region and supports many local governments, and of course Chinese interest is seen to be driven for the most part by the energy resources of many African countries. Through, the oil diplomacy China has already settled deep and prospective partnerships with some of these countries. (Goncharuk, 2011)

China has also been accused of propping up corrupt governments across Africa. (Taylor, 2006) Many thus question whether China is becoming an irresponsible power. For example, Lyman (2005) debated the purpose of cooperation and aid in Sino-African relations, arguing that aid flowing to Africa lacks transparency and offers a protective umbrella for countries which should instead be sanctioned. This lack of transparency fuels corruption within African governments; unconditional aid packages allow many projects to be approved without question, providing yet more opportunity for corruption. Lyman criticises China's reluctance to get involved in other countries' politics, because he believes that as politics affects the circulation of energy, China could wield great influence in this regard. He claims that China's pure investment, regardless of the specific flow of funds, encourages greater tolerance of corruption and represents an irresponsible force in Africa. Shinn and Eisenman (2012) offer a similar argument, declaring that in opening the door to African oil supply, China has sacrificed both democracy and human rights. They state the examples of Zimbabwe and Sudan when accusing China of disregard for human rights. In sum: 'China's no-strings-attached buy-in to major oil producers, such as Angola, will undermine efforts by Western governments to pressure them to open their oil books to public scrutiny.' (Taylor, 2006b:para.19)

In the *Yellow Book Annual Report on Development in the Middle East and Africa No. 13 (2010-2011),* Yang (2011) illustrates that as a result of

China's industrial upgrading, a large amount of equipment is available for transfer to Africa. In addition, there are many small and medium-sized enterprises in China, which meet the needs of African countries in terms of capital, technology and products. Africa in turn provides valuable opportunities for these enterprises – this is another win-win situation.

The Chinese government stresses that its aid is provided with sincerity and with no conditions attached. The goal of aid is to help African countries by building their capacity to achieve self-management. (Fourm on China-Africa Cooperation, 2012) As Moyo (2010) mentions in her book *Dead Aid: Why aid is not working and how there is another way for Africa*, Chinese aid differs significantly from that of Western countries. She argues that Africa must untangle itself from the yoke of dependence on outside aid in order to pursue its own path to independent development. Chinese aid aims to be based on equal conditions to achieve South-South, win-win cooperative partnerships. China attaches importance to African countries transforming energy resource products into a deep processing capacity, adding to the value of the products, thus helping African countries turn energy resource advantages into development advantages. (Xinhua News Agency, 2012b)

Regarding arguments concerning human rights in Africa, as stated in Taylor (2006b:939), the Chinese government argues that 'human rights such as *economic rights* and *rights of subsistence* are the main priority of developing nations and take precedence over personal, individual rights as

conceptualised in the West.' As Hanson (2008) explains, Chinese leaders tend to consider human rights to be a relative concept, adaptable according to specific conditions and periods of time. For example, in terms of arms sales to Sudan, the Chinese government argues that it is helping Sudan to improve its conditions by 'enhancing its status as an international political power, and increasing its ability to obtain access to significant natural resources, especially oil.' (Grimmett, 2009:10)

It is the Chinese belief that China and African countries are sincere cooperative partners. (Information Office of State Council, 2006) In 2007, President Hu visited eight African countries and delivered a speech stressing that in the past, present and future, the Chinese and African people share equality, mutual trust, friendship, mutual benefit and win-win cooperation. He underlined that China will never add any conditions to its aid nor interfere in African politics. (Xinhua News Agency, 2007d)

However, the counter-arguments of the Chinese government outlined above are just that: government arguments. This is the official stance on the charges of neo-colonialism. There is no doubt that neo-colonialism would influence the establishment of Sino-African commitments, but it seems that commitments are being successfully drawn up, which suggests that the accusations of Chinese energy colonialism are not necessarily shared by Africa itself. Relations between China and Africa have historically been positive, and there have been no instances of betrayal or *tit-for-tat* revenge in

the game of Sino-African energy co-opetition. Instead, it would appear that commitment has been maintained in Sino-African co-opetition through a firm emphasis on the principles of *Hehe* culture, whereby *peace is precious* and both sides stress *harmony but not sameness*. From the *Five Principles of Peaceful Co-Existence* through to Zhou Enlai's *Eight Principles for Economic Aid and Technical Assistance*, the Chinese government recognised the importance of treating aid recipients with respect and helping developing nations without conditions. From this positive starting point, Sino-African relations have continued to follow the tenets of *Hehe* culture; in China's Africa policy in 2006, it was clearly stated that both China and Africa maintain mutual respect and mutually beneficial co-existence. (Office of Ministry of Foreign Affairs of the People's Republic of China, 2006) The latest Sino-African policy in 2013 also reiterates the importance of equal and mutually beneficial cooperation. (Information Office of the State Council of The People's Republic of China, 2013b)

Furthermore, China's loan outreach to Africa is neither a donation nor a crippling condition to force Africa's hand. The Chinese government advocates long-term low-interest loans to Africa, which corresponds to the actual conditions of the African economy and allows development programmes to get on their feet. (Information Office of the State Council of the People's Republic of China, 2006b) In this way, Chinese loans will enable African economic growth and self-reliance, and will not encourage African

over-dependence on China. (Sun, 2014)

In sum, the combination of positive historical relations supports assumption ten, and the firm adherence to *Hehe* culture in Sino-African relations has taken a natural path to the extensive cooperation of today, be it in terms of energy or in other fields; the accusations of neo-colonialism are largely unfounded. It is *Hehe* culture that has smoothed the way to firm commitments in Sino-African co-opetition, and it is not too optimistic to assume that these conditions will remain in the future.

6.2.4 China's Tactics in Africa

In terms of the assumption eight, China has not taken a fixed approach to tactics towards African countries, but has chosen tactics based on the Sino-African resource asymmetry. China's three major methods in co-opetition with Africa include: directly importing energy from Africa and supporting programmes such as loan-for-oil or investing in mining; exchanging technology to achieve cooperation; and using aid initiatives to boost cooperation. China became formally involved in Africa's energy sector from 1990 onwards, beginning with petroleum trade and energy exploration. (Office of Ministry of Foreign Affairs of the People's Republic of China, 2006)

Table 20: Top Ten African Trade Partners with China by Imports from 2006 to 2010 (Lu, 2011:app.1)

	Economic type	Average annual trade, 2006-2010 (US $ million)	Share in total China-Africa trade
Angola	Oil export	18,627	21%
South Africa	Diversified economy	166,86	18%
Sudan	Oil export	6,445	7%
Nigeria	Oil export	5,774	6%
Egypt	Diversified economy	5,384	6%
Algeria	Oil export	4,155	5%
Libya	Oil export	4,154	5%
Republic of the Congo	Oil export	3,241	4%
Morocco	Diversified economy	2,548	3%
Benin	Agriculture	2,097	2%
Weight of top ten trading partners in total China-Africa trade			76%

As shown in Table 20, the most significant country for energy exporting to China is Angola. Since 2000, China has made a series of pledges to cancel outstanding interest-free loans extended to Least-Developed Countries (LDCs) and Heavily Indebted Poor Countries (HIPCs), most of which are in Africa. (OECD, 2012) These pledges set the stage for the beginning of China's concerted investment in Angolan energy reserves, and spurred the creation of the so-called *Angola Model*.

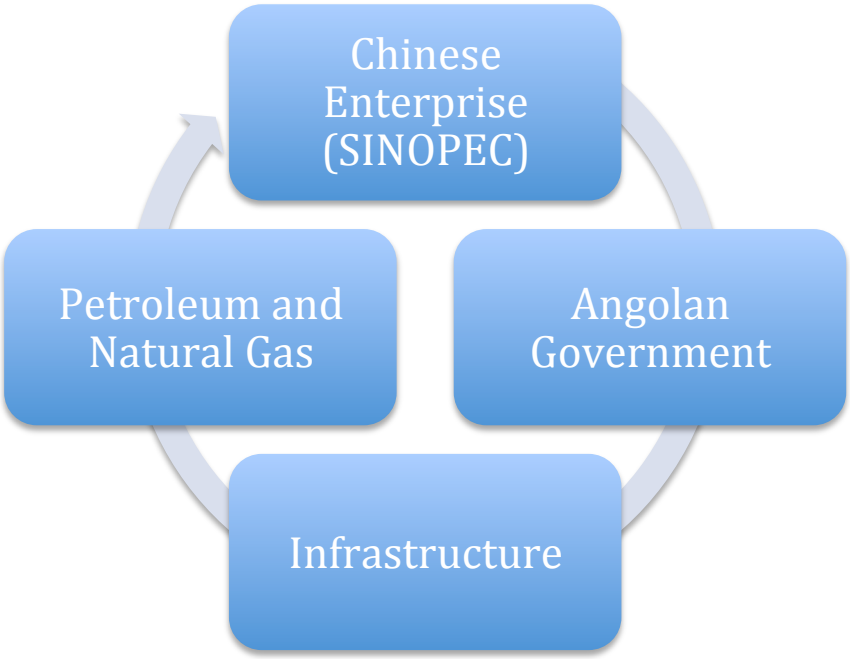

Figure 24: The Angola Model (Researcher's own)

Figure 24 depicts the Angola Model. The Chinese government supplies loans to the Angolan government through the China Petroleum and Chemical Group (SINOPEC), helping Angola establish infrastructure. With improved infrastructure, Angola is better prepared to supply oil and gas to SINOPEC, which then enters the Chinese market. In other words, the Angola Model involves the purchase of Angolan oil by SINOPEC, which is transferred to Angola's import-export bank. China then receives a steady, stable supply of energy. In turn, Chinese companies export commodities or contract construction projects in Angola, helping to resolve Angola's lack of construction funds.

In 2002, Angola began to apply for preferential loans from China. From this point until 2008 the Angolan government received financing from China on three occasions, totalling $4 billion. Angola exported 10,000 barrels of crude oil daily as a reimbursement guarantee. In addition to government funding, Chinese enterprises are also involved in Angola's economic restructuring, not only for the oil project itself, but also agriculture, electricity, drinking water, highways, railways, hospitals, schools and infrastructure construction investment. In 2008, the Angolan railway (Luanda Railway), measuring 424 km in length, was completed through the channelling of Chinese international funding. (Xinhua News Agency, 2008)

The Angola Model fits with the idea of mutual benefit, because China has been able to secure oil supply in Angola and implement the national Chinese strategy of *going out* [in business], whereas Angola has obtained the capital desperately needed for further economic construction. In the process of exploring Angolan energy, China has met its own national demands and Angola has been able to fund greater development. According to the Angolan Ambassador to China, João Bernardo, the Angola Model is welcomed by the Angolan government. (Zhang, 2012b) Furthermore, Chinese enterprise investment broke the virtual monopoly of Western countries, bringing competition and vitality to the Angolan market. (Yu, 2009) In other words, this kind of cooperation mode has not only won the support of the Chinese government, but also that of the partner country governments.

With the success of the Angola Model, several other countries soon followed suit. By the end of 2004, China's oil and gas cooperation projects in Africa had expanded to Algeria, Libya, Egypt, Ivory Coast, Nigeria, Gabon and Sudan; eight countries in total including Angola. By the end of 2011, imports of crude oil from Africa accounted for 23% of China's entire import total, a powerful support for the requirements of China's economic development. (Wang, 2012a) In 2007, former President Hu Jintao visited Sudan, Mozambique and Zambia, signing a series of cooperation agreements including, but not limited to, cooperation on energy supply. (Xinhua News Agency, 2007c) These high-level diplomatic visits show the Chinese government's attention to Africa, and the continuing progression of successful Sino-African relations.

Nevertheless, some observers still maintain that China and the African nations are not equal partners in cooperation, even in the face of the successful Angola Model. Marysse and Geenen (2009) believe that agreements between Africa and China are inherently unreasonable because of the inequality in the relationship. They also argue that China relies on unequal political relations and economic plunder purely in pursuit of its own interests, sacrificing the interests of African countries. An American broadcast (SBS, 2013) also debated the Angola Model, pointing out that not everyone agrees on the use of the model. Whilst exchanging energy and resources in return for investment and the construction of infrastructure certainly appears

like a good deal on paper, it in fact may condemn local people to greater levels of poverty than before. Also, despite the growth of infrastructure in Angola, the country still lacks the domestic workforce to man the development. Further to this, many Chinese shops have opened which sell low-price products, and Chinese businessmen have begun to sell agricultural products to plant in the local land, potentially disrupting the traditional agricultural economy. According to Alizak (the director of an Angolan human rights organisation), between 40 and 60 thousand Chinese people worked in Angola during 2009 and 2010, and the number has continued to grow. It is these Chinese workers who construct most of Angola's new infrastructure, assisting the country as a whole. However, Angola's benefit in this regard is somewhat limited: firstly, all the labour is provided by cheap Chinese workers; secondly, Angolan people will not benefit from any money earned by investment, because this money will counter-flow back to China. (SBS, 2013) Flynn (2013:para.24) mentions that Africans are themselves in great need of jobs, which are being taken by the Chinese: 'Unlike Western immigrants, the Chinese diaspora comes from the poorest section of society and competes directly for work with Africans, some 80 percent of whom are in 'vulnerable employment' according to the International Labour Organisation.'

This points to some of the major limitations of the Angola Model, and indeed in recent years passion for this model has been drying up somewhat. The cooperation between China and Angola worked so well because it came

at the exact time that both countries' needs could be met by the model. (Zhang, 2012b) In other words, China injected considerable capital into the Angolan economy, spurring much-needed growth, and China in return was able to relieve its own energy demands. This kind of cooperative model will work when the conditions are in place, but may not be a suitable method of long-term equitable co-opetition.

The second method is the use of technological exchange to bring about cooperation. The director of the Chinese Energy Bureau, Zhang Guobao, mentioned in an interview on the maintenance of energy security that exploring new technology and cooperating with Africa on the reasonable use of nuclear energy would provide a suitable solution for China's energy security needs. (Guo and Pan, 2011) The Chinese government cooperates with Africa on nuclear energy, developing this new source to reduce the dependence on traditional fossil fuel and helping Africa reduce pollution and achieve sustainable development.

According to reports from the WWF, current water and electricity supply cannot meet the demands of the increasing population in Africa. (Nguyen-Khoa et al., 2012) However, Chinese imports of African oil fund the construction of useful related infrastructure, such as hydraulic electricity generation. Once again, this is of mutual benefit to both sides. The Chinese government has declared its intentions to assist Africa with groundwater

development (Xinhua News Agency, 2012b), suggesting that China is aiming to relieve the fundamental issue of water shortage in Africa.

The third method is the use of aid initiatives including pure economic aid to boost cooperation. According to the principles of China's policy toward Africa, aid is based on equality and mutual benefit and carries no political conditions. (Office of Ministry of Foreign Affairs of the People's Republic of China, 2006) Aid may include economic infrastructure establishment; China's cooperation with Sudan can be considered economic cooperation of this sort. The Chinese government has provided different aid packages to assist Africa, such as free loans and interest relief. The timely provision of direct economic aid by the Chinese can help promote economic development in Africa. In February 2004, Hu Jintao visited Egypt, Gabon and Algeria, and signed a bilateral trade agreement and memorandum with Gabon. The first project agreed upon costs of a total of $12 billion and related to economic and technical cooperation. China offered this sum as free aid, Secondly, China will provide another $60 billion in loans to cooperative projects. (Xinhua News Agency, 2004) The Chinese government also provides funds to help local governments build fundamental infrastructure to serve the local people, such as libraries, roads, railways and hospitals. By 2010, China had carried out more than 900 projects, and trained 30,000 skilled experts and 180,000 medical workers. (China.com, 2012)

In conclusion, China applies three different methods to Sino-African co-opetition, which match China's own strategy for energy security. These tactics have mostly been successful, but certain negative aspects have drawn heavy criticism and accusations of inequality and predatory approaches. In truth, whether these accusations are founded or not, the existence of doubts over the nature of China's assistance to Africa plays into Africa's favour. China's global reputation may be impaired by the negative aspects of Sino-African co-opetition, and in the complex game of many rival players in Africa, African countries are well-placed to make use of these doubts to maximise their benefits. This will cause greater difficulties for Chinese activities in Africa, and as such it is imperative that the Chinese government irons out the wrinkles in its tactics in order to ensure the long-term success of Sino-African co-opetition.

6.2.5 Scope: Ensuring Long-Term Co-opetition

African energy undoubtedly helps relieve China's energy security concerns. In the short-term, it increased import channels in order to meet China's increasing demand. But what about in the long-term? As Taylor (2006b) points out, China hopes to improve its global reputation and gradually become a more powerful player in long-term global energy allocation. Can this target be achieved through FOCAC or another multilateral dialogue such as the Forum

for Economic and Trade Cooperation between China and Portuguese-speaking countries (PSCs)[51]?

Basically, establishing cooperation means finding common background or interlinked points to improve communication with Africa, thereby achieving the objective of cooperation. The establishment of FOCAC in 2000 was designed to provide a platform for Sino-African cooperative relations and a basis for the establishment of a Sino-African energy forum. (Fourm on China-Africa Cooperation, 2012) This forum is based on the principles of mutual benefit and sustainable development, with the hope of encouraging cooperative projects of clean energy and renewable resources. In addition, as the two largest developing global actors, co-opetition between China and Africa plays an important role in the promotion of overall world peace and development, in accordance with the fundamental interest of both sides. (Xinhua News Agency, 2012b) According to Beijing, the goal of FOCAC is to make the pie bigger, leading cooperation into a new fast-track of development and matching the national *go out* strategy. (Fourm on China-Africa Cooperation, 2012) However, this is simply the wording of official documents. In reality, the most important function for long-term Sino-African co-opetition is not necessarily making the pie bigger, but rather improving communication and information exchange. In this way, both China and Africa

[51] African Portuguese-speaking countries (PSCs) are also collectively referred to as Lusophone Africa. Formerly colonised by the Portuguese, these countries include Angola, Cape Verde, Guinea-Bissau, Mozambique and São Tomé and Príncipe.(European Commission, 2013)

will be able to understand each other's viewpoints and behaviour, and will be able to take appropriate reciprocal actions based on this mutual understanding.

In addition, due to the similar historical background and cultural context of Macau and Lusophone Africa, the Forum for Economic and Trade Cooperation between China and Portuguese-speaking countries can provide a key platform for communication and cooperation. Now booming bilateral trade between China and Lusophone Africa has experienced a sharp rise since the establishment of the Macau Forum in 2003. 18% of total trade comes from Africa and 2% of total trade comes from Lusophone Africa. (Alves, 2008) In 2012, the trade between China and Lusophone Africa amounted to $128.5 billion, an increase of 9.6% on the year before. In 2013, a new one billion dollar fund was officially established in order to support Chinese companies entering Portuguese-speaking markets. (Ventures, 2013)

However, in terms of Sino-African energy co-opetition, due to the amount of players involved, it is most sensible for the Chinese government to cooperate with the most inclusive African body possible. The African Union is a suitable choice. (Ministry of Foreign Affairs of the People's Republic of China, 2014d) It is possible that an energy mechanism similar to that of OPEC could be created under the auspices of the African Union, which may be beneficial for the future of Sino-African co-opetition.

In fact, the establishment of an African Union will be conducive to greater stability in energy supply and demand, but it may be difficult to allocate quotas amongst the many energy-producer countries across the continent. If the African Union were to establish an energy mechanism (M) it would also have the capability to adjust the energy price. Two players from within M – Angola and Tunisia can be considered as an example. Assuming the production of Tunisia is TA while that of Angola is AA, the discount rate is *δ,* and high demand is *p*, Dutta (1999) draws the conclusion that $\delta \geq \frac{1}{1+2p}$. AA will not break commitment on quotas if *p>1*. However, if *p<1*, it would be difficult for betrayal on quotas to be prevented within M. In fact, new oil exploration in non-OPEC countries such as Russia reveals that China's reliance on OPEC has decreased. As a result, *p* has tended to be smaller than 1, which means that AA has the motivation to increase production to obtain more interest. In terms of TA's discount rate, if $\delta \geq \frac{19}{19+2p}$, TA will not break commitment on quotas and the result is that the smaller *p* is, the higher the likelihood of betrayal on commitment.

Global requirements for energy have recently weakened and OPEC does not plan to reduce production quotas, which is driving energy prices down. (Reed, 2014) It is thus not the right moment for African countries to establish an energy mechanism in the African Union. In terms of China, establishing a new energy mechanism in the African Union would mean that China would be limited to any quota decided by the AU. Thus it is not suitable

for either side to establish an energy mechanism at this stage. Although China supports cooperation with the African Union, this does not mean that China would necessarily support establishing a special energy mechanism in the African Union.

In conclusion, due to abundant reserves and extensive variety, lower exploration costs and favourable geographical locations, Africa has become one of the most significant players in the global energy game. As a result of the large number of countries engaging in competition, the continent is becoming a battleground in the race for resources. This chapter has discussed the internal co-opetition between African countries themselves, between China and African countries, and between China and other, non-African countries within the African context, all of which affect China's attempts at forging co-opetitive relations in Africa. Due to the different conditions of these partners, the outcome and success of co-opetition is variable. Nevertheless, the asymmetrical power between China and Africa dictates the success of Sino-African co-opetition. The intense degree of Sino-African complementarity supplies another important condition for successful co-opetition. The establishment of commitments based on *Hehe* culture and the possibility of establishing and balancing the supervision of FOCAC together represent fundamental conditions which may help ensure long-term Sino-African co-opetition.

Due to the development of China's economy, increasing energy demands push the country to actively find replacement markets to reduce its dependence on the unstable Middle East. This causes other countries to feel a sense of threat from China. Debates on China's energy threat and Chinese neo-colonialism have arisen, not in small part from the fear of Western countries that China will secure too large a portion of Africa's energy reserves. The Chinese approach may not be as predatory as it has been judged to be, due to the continuing commitment to mutual respect and benefit espoused by China's traditional *Hehe* culture and the long-term adherence to the *Five Principles of Peaceful Co-Existence*. Nevertheless it cannot be denied that there have been certain issues with the implementation of China's assistance to Africa within the scope of Sino-African co-opetition. For the sake of ensuring long-term cooperative relations, the next step for China in this sense would be to concede the existence of these problems and find ways to address the improvement of China's own performance within the game of Sino-African energy co-opetition.

Chapter Seven: Analysis and Conclusion

Chapter Two of this research analysed relevant literature in order to provide a theoretical background for understanding the strategic value of co-opetition. Based on these theoretical insights, an analytical framework was developed to investigate how China conducts co-opetition in energy security. Chapter Three addressed the development of the co-opetition strategy in China's energy policy, with *Hehe* culture running through Chinese foreign energy policy. Chapters Four, Five and Six applied the framework from Chapter Two to the cases of China's energy relations with three different international actors: Russia, Japan and Africa. This final chapter will consolidate the findings of the three case studies in order to proffer three key propositions for China's energy security, and finally present the conclusion of the research.

This research has interpreted the features of co-opetition theoretically, demonstrating that competition need not be seen as a threat, but that by transmuting competition into a relationship of co-opetition, there is more opportunity for integration and thus greater benefit to all involved parties. The PARTS model from game theory, consisting of Players, Added value, Rules, Tactics and Scope, has been employed in this research to clearly define the conditions necessary for successfully achieving co-opetition. These conceptual ideas can be applied to China's energy security, which has coherently adopted a co-opetitive approach to energy relations over time, due

to the heritage of China's ancient *Hehe* culture and the idea of peaceful co-existence espoused in China's modern foreign policy. With these insights in mind, three propositions have come through in the case study analyses:

(1)The strategic value of co-opetition promotes a new approach to China's energy security

(2)The PARTS model helps China to accurately evaluate the prospects for achieving co-opetition

(3)Chinese *Hehe* culture lends certain Chinese characteristics to China's co-opetition in energy security.

These three propositions will be discussed in turn in the following sections, and then the conclusion to the research will be presented.

7.1 A New Approach to China's Energy Security is Generated by Co-opetition

This section will respond to Section 3.1 of the analytical framework by analysing the transformation of China's energy policies, and will demonstrate how the strategic value of co-opetition can shape China's energy security. As examined in Section 2.1.3, the strategic value of co-opetition weakens the stranglehold of competition, moulding relations into a balance between healthy competition and cooperation that leads to greater integration. In the introductory chapter, this research illustrated that the principal and long-term problem plaguing China's energy security is that energy supply cannot meet

demand. This leads to a high dependence on foreign energy supplies. (Information Office of the State Council of the People's Republic of China, 2012b) The source just referenced also points out that secondary issues related to energy reserves, transportation, and emission reduction also trouble China's energy security. However, China's approach to energy security not only attempts to maintain or obtain more interest, but it also aims to make the interest larger and allocate it effectively. In other words, the strategic value of co-opetition, which enables greater integration and increased interests for all parties, can be applied to China's energy security to generate the most effective approach to achieving China's aims. By framing co-opetition as a benefit to the national energy security approach, China can take the opportunities afforded by greater integration whilst re-interpreting the timeworn idea that competition inevitably means threat. As Section 2.1 shows, co-opetition enlarges the common interest, which precisely matches China's energy security objectives.

As demonstrated in section 3.2, China's energy policy has been transformed over time from self-sufficiency in Mao's era to a co-opetitive approach that aims for co-existence and benefit for all parties. This transformation demonstrates that the emphasis on competition has been continuously weakening, and been replaced by a greater focus on mitigating conflict and building lasting peace with other nations and regions on the issue of energy. The former policy of self-sufficiency was introduced by Mao Zedong

for ideological reasons, and although self-sufficiency in essence meant China had to rely on itself more than others, there was also a great deal of competition in this era. This policy can be interpreted as reflecting the deep disquiet Mao felt in terms of handling relations with other countries, especially those with ideological and political differences. Self-sufficient policies such as *in industry learn from Daqing* greatly limited China by forcing the Chinese to handle all issues domestically rather than taking advantage of the opportunities granted by mutually complementary integration. Although this situation and policy stance was linked to China's internal and external influences at the time, the greater concern was what it meant for China: very few countries established friendly relations with China, or even recognised the legitimacy of the regime for a long period of time. (Wang, 2013a) China was unable to enter into the spirit of the internationalised world, and this isolation has left a lasting lesson for today's politicians. In the era of Deng Xiaoping, the Chinese government finally admitted that self-sufficiency could not spur the development that China sorely needed, and accepted that, rather than taking a circuitous, ineffective route, learning from the outside could directly accelerate China's growth. Deng thus deliberately downplayed competition, arguing that it should be overlooked for the sake of better development. However, due to the inheritance of Mao's long-term focus on self-sufficiency, a competitive stance still shadowed China's foreign policy, including energy relations. In Jiang Zemin's time, the development of the economy had snowballed and China

required significant integration within economies and uninhibited access to energy resources. Consequently, as Speed (2009) argues, the true focus on cooperation in China's energy relations formally began only in 2001. This suggests that China was now envisaging the concept of comprehensive energy security, and thus effectively relieving the limitations brought about by an over-emphasis on competition. Finally, during the era of Hu Jintao, the nature of co-opetition formally appeared in China's energy policy. The Chinese government began to transfer competition into co-opetition by championing resource integration. In the 12th Five Year Plan on energy, the key target was to 'go out and let the advanced in.' (Information Office of the State Council of the People's Republic of China, 2013a:XII) The two points here are equally important: firstly, the slogan, *go out* demonstrates that China wishes to break free of the cage of competition, and secondly, 'let the advanced in' hints at what cooperation could bring to China. Compared to previous policies, this balanced approach shows that the Chinese government has formally changed its strategy due to the new situation in which the country is operating.

The transformation of China's energy policy naturally suggests change to China's energy security. The policy reveals that neither a focus on competition or cooperation alone can solve China's energy security problems. With a growing interdependence between countries regarding energy, for the sake of national energy security, China must formulate a new approach to comprehensively handle the situation. Co-opetition does not eliminate

competition entirely, but reformulates it as a healthy balance to cooperation, allowing greater integration and benefit. This balanced approach provides a better approach to China's energy security than a focus on solely competition or cooperation.

In addition to this analysis of China's overarching energy policy, the three case studies of China's historical and current relations with Russia, Japan and Africa demonstrate that Chinese commitment to co-opetition has been gradually and steadily developing over time, albeit with slight differences depending on the nature of the two dyadic players in the relationship.

For instance, in the case of China and Japan, the two players are symmetrical in terms of their energy needs and demands, and have deep-running historical aggravations. According to Ferguson (2008), Mao refused to forgive Japan's actions in the Sino-Japanese war, and cooperation could not exist under these conditions. In Deng's era, China adopted the policy of overlooking grievances in the name of development, and began to sell crude oil to Japan and accept Japanese support for China's economic development. This represented a brief time of cooperation. However, after 1993, China's own rapid development had transformed it into a net import country for oil. The time of cooperation was over and China and Japan were now head-to-head rivals in the battle to secure international energy resources. In Jiang and Hu's respective eras, China's need for external energy supplies intensified, and the competition between China and Japan escalated in tandem. As this research

points out, China and other countries have come to realise that a relationship based purely on competition is not beneficial for any parties, and have recognised that co-opetition may alleviate both antagonistic bilateral competition and energy security issues alike. China and Japan have begun to enter into cooperation, but only on secondary issues such as energy reserves and emission reduction. These issues, whilst important, do not directly or immediately address the major problem of both countries' energy security: that supply cannot meet demand. Nonetheless, for these two symmetrical players, this limited cooperation may be the best beginning. In this case, assumptions one to four have been further supported by the cases. The international organisations, such as ASEAN+3, supervised the short-term co-opetition between China and Japan. But the failure of the bilateral organisation shows that stable co-opetition still relies on states and economic interdependence rather than other aspects.

Compared with Sino-Japanese energy relations, the Sino-Russian case is much more closely related to the transformation of China's foreign policy, as well as the different conditions and needs of Russia through time. In Mao's era, Sino-Russian energy relations went abruptly from cooperation to competition due to an ideological split between the two communist nations, but in Deng's era, this rift began to heal and formal cooperative efforts began to take shape. In Jiang's era, the real importance of energy cooperation was recognised and China began to make attempts to reach a more advanced

stage of mutual benefit. However, throughout this era, and into Hu's era, Russia's own geopolitical position was in a state of flux, which influenced the country's strategies towards energy. This is to say, according to assumption two geopolitical interdependence will influence co-opetition, but the economy is the inside cause. Besides this, many cooperative efforts were stalled as Russia swung between different cooperative partners and possibilities. Later in Hu's era, the two countries finally managed to reach a point where cooperation and competition were more balanced, and cooperative projects began to get moving. China's strategy had to adapt to Russia's changeable approach.

The third and final case was China and Africa. Good relations between China and many African nations began in Mao's era and have continued unabated until the present day. At the outset, China offered aid to African countries, and the relationship of co-opetition was based around this flow of assistance. The speed of cooperation and integration increased rapidly as Africa's energy market began to develop, and China simultaneously began to require energy imports. However, this does not mean that competition did not exist in Sino-African relations; rather, the competition came from the existence of third parties with similar needs to China, fighting for influence and benefit on the African continent. The Sino-African case thus demonstrates a different permutation of China's attempts to develop co-opetition in energy relations.

The existence of co-opetition with these three actors proves the transformation of the Chinese government's attitude towards energy security. By focusing on co-opetition, which entails a balance of both cooperation and competition, the government no longer deems competition a threat. Other players can be seen as cooperative partners, rather than solely as threatening rivals; China can now begin to see its energy security situation as an opportunity for value-added co-opetition and integration, rather than as a national threat. As identified in Section 2.1, co-opetition aims to integrate energy resources to the greatest extent possible. As such, China's energy security policies towards other countries, such as loan-for-oil programmes and laying pipelines, are a manifestation of China's attempts to integrate resources as much as possible to achieve the largest interest. Co-opetition is different to other policies, neatly incorporating the disadvantages brought about by competition and transforming them into a powerful tool for greater integration, making the pie – in this case access to energy resources – bigger for everyone. In other words, a commitment to co-opetition generates an entirely new approach for China's energy security.

7.2 How the PARTS Model Helps China Evaluate the Prospects of Co-opetition

The PARTS model from game theory has been used in this research to illustrate five dimensions of co-opetition: Players, Added value, Rules, Tactics and Scope. Breaking co-opetition down into these separate aspects makes a useful tool for research but it can also be applied practically by China to evaluate the prospects of co-opetition on energy with different partners, thereby adapting strategy to dissimilar conditions. The five dimensions are interconnected, and only by understanding each aspect both individually and in concert can China effectively and accurately evaluate the concrete progression of co-opetition and make appropriate decisions. Chapter Two of this research analysed the factors leading to successful co-opetition according to the PARTS model, drawing another five assumptions. Firstly, co-opetition is more likely between asymmetrical powers. Secondly, a higher degree of complementarity means a greater likelihood of successful co-opetition. Thirdly, the establishment of firm and trustworthy commitments and reciprocity binds relations of co-opetition. Fourthly, tactics must be adapted to repeat games with different partners, taking into account current conditions and historical developments. Finally, the scope of co-opetition must be monitored by international regimes to ensure success. The following sections will outline the findings of the case studies with regard to these five assumptions.

7.2.1 Recognising the Role of Players in the Game of Energy Co-opetition

Understanding the potential nature of different players in different scenarios can help China effectively pinpoint prospects for co-opetition with partners. As Chapter Two explains in depth, it is easier for two asymmetrical players to produce co-opetition, because their asymmetry can lead to mutual complementarity. However, symmetrical players will struggle to achieve co-opetition as they have the same resources and demand structure. For instance, China and Japan struggle to successfully reach a position of co-opetition because, in terms of energy resources, the two are symmetrical players. Both players have to rely on large imports of energy to meet the demands of their industrial growth, and thus the two are pitted against one another in the world market. As Section 2.2.2 elaborates, two symmetrical countries share the same requirements, and this is reflected in the Sino-Japanese case: both rely on the same suppliers and have constructed similar tactics to gain national interest in energy security. This scenario means that in the payoff matrices of the Sino-Japanese energy game, China and Japan will both seek to obtain the largest interest, and defection is the most probable outcome. Cooperative efforts are unlikely to succeed under these conditions. Furthermore, as shown in Section 4.2.1, both China and Japan see energy as a private good, rather than a public good, which further influences their attitude towards the energy game. As both sides view energy as a private

good, it is hard for the two rivals to overcome their seemingly irreconcilable differences on energy, particularly in terms of imports, but also on projects like joint exploration. Although co-opetition seems too much of a stretch for China and Japan in these particular areas, it does not mean that there is no potential for co-opetition whatsoever. This research has identified that the two players may be able to succeed in areas with greater potential for complementarity, such as renewable energy, energy reserves, and emissions reduction. In other words, the two cannot achieve co-opetition in aspects concerning more traditional non-renewable energy, but may do well in renewable energy cooperation.

Unlike the symmetry with Japan, China and Russia are asymmetrical in terms of energy. As Section 5.2.1 shows, China is a customer and a net importer of energy, whereas Russia is a producer and supplier of energy. This means that in the Sino-Russian energy game, there is a great difference in resources between the two countries, and this asymmetry means that success in co-opetition is far more likely. However, as Russia is the side possessing the desired resources, it has long played the role of dictator in the game, able to change the outcome at whim. China has been a far weaker player throughout the eras of Mao, Deng and Jiang. During these periods, the involvement of third parties has allowed Russia to safely defect from cooperation without long-term consequences, gaining a greater interest from cooperating with others in the game. As China has remained keen to build relations with Russia

and access Russian energy reserves, the government has had little choice but to accept Russia's stop-start approach to co-opetition. China's relative weakness in the asymmetrical dyad has limited its flexibility and power in negotiations, so final decisions on pipeline projects and energy prices have typically rested with Russia. However, in the current geopolitical climate, Russia's need for China has increased and since the era of Hu Jintao, the asymmetry has begun to work to China's advantage; this will be discussed in more detail in the next section. The asymmetry between China and Russia has meant that co-opetition is a distinct and likely prospect, but the extent of Russia's power has had destabilising effects on the progress of efforts.

The third case in this research has been another asymmetrical relationship: that between China and Africa. Unlike Russia, Africa does not have absolute power in the game, and as a result, Sino-African relations have remained smooth over a long period of time. However, as Chapter Six explains, Africa is a special case. China and African countries do share asymmetrical relations, but the African energy market is complex and involves a great many other players. In this sense, Sino-African relations cannot be evaluated in isolation; rather, Africa is a battlefield where other asymmetrical partners, including both international players and other African countries, struggle amongst themselves for influence. Disregarding the role of these other players, relations between China and Africa have followed expectations for asymmetrical partners: mutual complementarity leads to integration and

co-opetition is smooth and straightforward. However, China's improper governance and sometimes misguided involvement in local infrastructure in Africa has led to a gradual slowdown in co-opetition. Neo-colonialism accusations and the China energy threat have overshadowed the formerly successful cooperation between the two players. At this point, the existence of other players in the Sino-African energy game has meant that African countries are spoilt for choice when it comes to co-operation with asymmetrical partners, meaning that China will not necessarily dominate the continent.

As identified in Section 2.2.2, the more players in the game, the less stable bilateral co-opetition will be. This is certainly the case for Africa, where the involvement of a large number of influential actors casts the incontrovertible success of Sino-African energy relations somewhat into doubt. Further to this, in the Sino-Russian case, the addition of a third party upsets the already volatile progress of co-opetition. For example, with the involvement of Japan, the Russian government is able to use its own absolute advantage in the game to swing between China and Japan in order to obtain the greatest interest for Russia. China must consider not only Russia's situation, but also the intentions of Japan, increasing the level of uncertainty for all players. In the case of asymmetrical powers, another power similar to China, such as Japan, can widen the options available to China's partner. This raises the level of complexity in the game and is an unwelcome twist for China. Thus in both the Sino-African and Sino-Russian energy games, the involvement of additional

players increases uncertainty and reduces the prospects for straightforward co-opetition.

However, the situation is different when the two players are symmetrical. The addition of an appropriate third party can break the deadlock of symmetry by introducing a new balance to relations. For example, as Chapter Four proposes, the involvement of Taiwan or the United States in the energy game may create a new dynamic. Analysis of the influence and value of these third parties can help China evaluate the prospects for success in different aspects of the Sino-Japanese case, such as joint projects on exploration of renewable energy.

In conclusion, it is difficult for two symmetrical powers to achieve co-opetition, particularly when energy is deemed to be a private good, but it is far easier and more likely for co-opetition to succeed between asymmetrical players. The inclusion of third parties in the energy game can have a different effect on the dynamic: in the case of asymmetrical powers such as China and Russia or China and Africa, additional players can upset the progress of co-opetition, whereas for symmetrical powers, other players can lend a degree of asymmetry to relations, increasing the prospects of successful and stable co-opetition.

7.2.2 Greater Common Interest Derives from the Added Value of Power Asymmetry

The sixth assumption suggests that a higher degree of complementarity can bring added value to co-opetition, increasing the prospects for success between asymmetrical powers. For symmetrical powers, the lack of complementarity reduces the chances for added value and further reduces the chances of achieving co-opetition. In the case of Sino-Japanese energy co-opetition, the degree of complementarity is exceedingly low, as the two countries share similar attributes in terms of energy. However, there is a slight degree of economic complementarity; as Stern (2003) proposes, there is a positive correlation between energy and the economy. This economic complementarity is not sufficient to push China and Japan into cooperation on energy exploration or energy imports, but it is more influential in terms of renewable energy and emissions reduction projects. Japan is able to supply capital, whereas China is abundant in labour. Nonetheless, the economic complementarity is low and decreasing, and the chances for success remain limited. This demonstrates how the low complementarity of partners with symmetry in energy cannot do enough to boost co-opetition, even if there is somewhat higher complementarity in another field such as the economy.

The story is very different for asymmetrical powers. For instance, there is a high degree of complementarity in Sino-Russian relations, not only in terms of energy supply and demand, but even more so with regard to

strategies and geopolitical advantages. As Section 5.2.2 argued, the degree of complementarity between Russia and China has been growing, which is reflected in the growing success of Sino-Russian co-opetition. In the eras of Mao, Deng and Jiang, Russian advantage was so absolute that China had little power to negotiate, but in Hu and Xi's eras, China's power has grown relative to Russia's, for example in terms of economics and geopolitical power. This trend has reduced the absolute advantage of Russia, which increases the degree of complementarity. The added value of multifarious complementarity has smoothed the path for successful co-opetition.

Similarly, in the case of China and Africa, the degree of complementarity seems high. However, this is a little misleading, as the complementarity is limited to energy supply and demand and economics. This may not be a sufficiently multifaceted complementarity to ensure the added value beneficial for continuous stable co-opetition. The supply and demand complementarity is high, but this is common between producer and consumer countries. Rather, it has been the high degree of economic complementarity that has promoted the speed and degree of Sino-African co-opetition. As explained in Section 6.2.2, African development has required considerable help from outside, and China has been a strong supporter of African development for decades. Considering African resources, Africa should be in a similar position to Russia, enjoying an absolute advantage which allows Africa to call the shots in the Sino-African energy game. But Africa's low economic

development has been hindering this advantage and ensuring higher complementarity, which explains the success of Sino-African co-opetition thus far. Africa continues to rely on aid from foreign countries, and an average 46.1% of GDP is used for paying back debts. (International Emissions Trading Association, 2014) In these conditions, despite massive energy reserves, African countries' hands are tied, and contrary to the expected outcome for energy producer countries, co-opetition has been dominated by consumer countries such as China. However, as Section 7.2.1 pointed out, the great number of players attempting to gain influence in Africa is creating a new layer of complexity in the Sino-African game and eroding some of China's share in the African market. As these other competitors, such as Japan, India, the United States and the European Union, also share economic complementarity with Africa, the findings regarding the importance of added value demonstrate that, in order to compete, China needs to work on building up alternative areas of complementarity to ensure that a secure co-opetitive relationship can be maintained in the long term.

In other words, besides complementarity of supply and demand, economic complementarity between asymmetrical partners is not enough alone to ensure co-opetition. As further areas of complementarity have developed, Sino-Russian co-opetition has improved; Sino-African co-opetition, based on the sole added value of economic complementarity, may not be strong enough to withstand the involvement of third parties. To bring about the

added value necessary to ensure successful co-opetition with partners, China would benefit from considering diverse areas of complementarity.

Another aspect to consider is that the degree of complementarity can actually dictate how large the pie of interest is. As shown in Section 2.2.2, in the function $P=(x+y+RXY)$, where R is the degree of complementarity, P is the total common interests, and all other values are constant, it is the degree of complementarity that decides the ultimate size of the pie that players can share in the game (P). As this chapter has mentioned, one key objective of engaging in co-opetition is to make the pie as big as possible. Thus, within co-opetition, the higher the degree of complementarity, the bigger the pie and the more interest players can obtain.

In the case of China and Japan, this degree of complementarity is particularly small, suggesting that the two are unable to create a large pie of common interest. In the Sino-Russian case, the degree is larger and the pie is correspondingly enlarged through successful co-opetition. Finally, for China and Africa, the degree of complementarity is high, but not as high as Sino-Russian complementarity. It is not yet multifaceted enough to reach this degree. The higher the degree of complementarity, the more interest that can be created; or in other words, the interest that asymmetrical players can earn is higher than that available to symmetrical players.

In conclusion, the degree of complementarity brings added value to co-opetition between two players, and the extent of this complementarity

decides the size of the pie, or the common interest, of two players. In a symmetrical dyad, the added value is weak, and co-opetition is a less attractive option. In an asymmetrical dyad, the added value is high and co-opetition will increase interests for both players. However, if the asymmetry is skewed excessively in the favour of one player, this can lead to a dictator game, where the powerful player almost unilaterally controls the final outcome. The conditions most conducive to successful co-opetition are asymmetry balanced by complementarity in a wide range of different areas. The added value of other balancing areas strengthens existing co-opetition and creates a scenario of greater mutual interdependence. Of the three cases, both Russia and Africa show excellent potential for co-opetition: Russia and China have strong complementarity in a range of aspects, and as Russia's former absolute advantage lessens, Sino-Russian relations could strengthen. In the case of China and Africa, the dictator game seen between China and Russia has been avoided due to the extreme economic disadvantage of African countries, but in order for China to maintain a healthy relationship of co-opetition, it is important to engage the added value of areas outside purely economics and energy supply and demand.

7.2.3 Establishing Commitments is Important for Long-Term Co-opetition

Assumption seven proposed that commitments and reciprocity are important for the ongoing maintenance of co-opetition, and that it would be easier for asymmetrical players to establish commitments than it would be for symmetrical players. In the case of Sino-Japanese co-opetition, it has been difficult to establish commitments due to the intense competition over energy, as well as strained political relations over territory. This outcome is expected for symmetrical pairs.

As Section 2.2.2 explains, energy can be seen as either a private or public good, and a country's stance on this can strongly affect their energy security strategy. Although fossil fuels could arguably be deemed public goods due to their non-renewable nature, the position of both Japan and China is that energy is a private good, and neither side is willing to give up and lose interest over a private good. It is therefore extremely difficult for China and Japan to establish commitments to, for example, joint exploration of the East China Sea.

Even if an initial commitment on energy can be drawn up, game theory shows that it will end with a betrayal by at least one player. Furthermore, in repeat games, due to the occurrence of treachery, revenge would be a rational response. One player's analysis of the degree of the other's treachery may dictate the intensity of the revenge response, and any move that is out of

proportion may lead to the worsening of relations, spreading out well beyond the energy game itself. The difficulties of co-opetition between China and Japan can thus be framed in this sense; both sides are maintaining their interest, which doesn't mean that either side is necessarily in the right or in the wrong. Neither side can tolerate an attack on sovereignty or territorial claim and compared with this high-interest issue, energy exploration is an easily sacrificed affair, particularly when the two sides lack added value of complementarity, and are symmetrical in terms of energy security. Although reciprocity can exist when the two sides attempt co-opetition, as explained by METI (2011) in Section 4.2.3, due to the unlikely success of establishing commitments, attempts at reciprocity may still not go much further to salvaging the situation.

Compared with the difficulties of establishing commitments between China and Japan, the situation with the asymmetrical pair of China and Russia is more positive, and is in fact an ideal case to suggest the accuracy of the assumption that commitments and reciprocity are important for the ongoing maintenance of co-opetition. Chapter Five showed that the current trusting cooperation between China and Russia did not happen overnight; rather, over repeat games of co-opetition, the two players were able to slowly build a deeper understanding of one another's demands and interests, establish long-lasting commitments, and demonstrate their trustworthiness through continual reciprocal actions.

As Russia had absolute advantage in the game, it was for Russia to initiate the first commitments. Russia's attitude towards cooperation shaped the path for commitment-building between the two players. During the periods of Mao, Deng and Jiang, cooperation was shaky due to Russia's own attitude towards cooperation, combined with China's low level of complementary advantage, which decreased the attractiveness and effectiveness of co-opetition with China. With the high-speed development of the Chinese economy and the creation of national strategies relevant to Russia, such as revitalising the old North-East industrial base, as mentioned in Section 5.2.2, Russia was able to cooperate with China to bring about more added value for both sides. Sino-Russian interdependence became closer and cooperation was more and more frequent. Once commitments were established and consistently kept, and reciprocal actions were initiated time and time again, a deeper level of trust was achieved. This commitment and reciprocity has created a virtuous circle which could help cement long-term co-opetition.

Finally, the case of China and Africa is similar to that of China and Russia, further corroborating the importance of establishing commitments, but one significant difference is the tense pressure of external influence. This includes disputes over the China energy threat and neo-colonialism, which may undermine trust-building and be harmful to the establishment of commitments. Even if China and Africa are able to construct initial

commitments, it may be that outside pressure detrimentally affects their continued success.

In conclusion, the establishment of commitments can indicate the feasibilities of successful co-opetition. It is difficult for symmetrical powers to even initiate commitment, whereas asymmetrical powers may be able to establish solid commitments more easily. Once commitment has been established, it can be maintained through reciprocity and trust-building. However, commitments are not eternal or unshakeable, and are likely to be influenced by increasing or decreasing interdependence and tense external pressure.

7.2.4 Flexible Tactics are Dictated by Historical Influences and Current Conditions

According to the eighth assumption, the Chinese government must adapt tactics to the conditions in which it finds itself. When faced with an asymmetrical power, the role of dove may prove more effective, whereas a hawkish approach is preferable with a symmetrical player. The choice to be either a dove or a hawk in the game does not mean that China fears or threatens the other party; rather, it is a case of selecting the most effective tactics to gain interest by considering the circumstances of each individual game.

Due to the nature of the intense competition in energy between China and Japan, both countries have adopted a hawkish stance. As identified in Table 16 in Section 4.2.4, the combined payoff for both of them as hawks is the lowest. However, though both sides know this final payoff, neither will choose to act as a dove, lest the other obtains more relative interest due to their own weakness. By contrast, tactics in the cases of China and Russia and China and Africa are different. In both games, China opts for the tactics of a dove. The asymmetrical power prevents China or any one party from obtaining absolute advantage. Although China has relatively more complementary advantages paired with Russia than with Africa, China is not a producer country and must rely on energy imports. It is thus reasonable for China to obtain relatively less in the payoff. Although choosing a dovish approach in both the Sino-Russian and Sino-African game may not earn China the most interest in the immediate term, it is imperative for China to maintain imports, and a dovish stance is the most beneficial for continued co-opetition.

China's choice to be a hawk or a dove is not determined by any particular partner country, but rather by the situation in which China finds itself. In other words, there will not be any one specific, rigid strategy or set of tactics in different games of co-opetition with different partners. Instead, by allowing flexible strategy, China will be able to adapt to the conditions of each game and take into account current conditions. As a result, the three cases reveal a variety of tactics used by China. For instance, Japan and China are attempting

to turn their focus away from the fraught issue of energy exploration in contested territory to place greater emphasis on energy reserves and emissions reduction. With Russia, China has been committed to loans-for-oil, which exploits China's current economic advantage, as well as deals over pipelines that relieve China's energy supply concerns. Finally, the three major tactics in Sino-African relations are loans-for-oil, technological exchange and aid initiatives. These three approaches allow China to rely on Africa's relatively low level of development in order to secure energy imports for China.

Further to considering current conditions on a case-by-case basis, the case studies also corroborate the assumption set out in Chapter Two that tactics will be influenced by historical circumstances. Players are not only compelled to adapt tactics to current conditions, but also seemingly cannot help but be affected by past influences. The nature of historical relations may shape the likelihood of establishing commitments and opting for certain strategies in the contemporary situation. The key example is China and Japan: relations between the two powers have been strained since the founding of modern China in 1949 – due to historical reasons. Following the Second World War, there was a brief honeymoon period during which time China was able to export crude oil to Japan, and historical differences were set aside. However, as identified in Section 4.1.2, energy cooperation is highly driven by the requirements of economic development, and it can be easily destroyed by changes in this balance. (Guo, 2008) Since China became a net importer and

this brief flicker of early co-opetition was extinguished, it has been difficult for the two to establish any kind of long-lasting co-opetition.

Sino-Russian relations are closer than those of China and Japan, although there have been rocky times and an ideological parting of ways due to decisions made by the countries' respective elites, especially during the eras of Mao and Deng. However, due to the excellent prospects for complementary geopolitical advantages, China and Russia have maintained relatively good relations. There has not been a substantive conflict over energy, and China has applied gentle dovish tactics, even in the face of Russian vacillation on commitments.

The third case, between China and Africa, further demonstrates the importance of good relations to final tactics. China has taken a gentle approach and has not shied away from playing a dove in the game. Even so, with the spread of the China energy threat theory, China's endeavours in Africa have been interpreted by others, and Africans themselves, as an intention to colonise. Although China's intentions may well be innocent - simply a win-win approach to energy supply and economic support in an underdeveloped energy-producing location - Africa's colonial history unfortunately raises sensitivity and therefore potential misunderstandings. In order to avoid these accusations, China may have to assess its approach to investment in infrastructure and governance, and make sure no activities can be labelled improper. Perhaps an even deeper consideration for the Chinese

policymakers is whether China has in fact been too dovish and lost out by putting too much into the maintenance of good relations with African countries.

The best tactics for a country to adopt vary on a case-by-case basis. There are no fixed or specific tactics in the energy game, and the same approach may not be used with the same partner at different points in time, or with different partners at the same time. In order to truly play the game, China can make use of flexible tactics to adapt to the current conditions of each game, and draw on the influences of historical legacy in order to further shape tactics.

7.2.5 The Scope of China's Energy Co-opetition: Entering into a Suitable Energy Mechanism

In line with assumption nine the scope of China's future energy co-opetition may be bounded by energy mechanisms, a function of the international regime. Chapter Two explained that bilateral commitments may be difficult to uphold when conditions waver or trust is called into question, and monitoring by the international regime may help consolidate trust and bolster any commitments made. This monitoring can take many forms, and it has been suggested in this research that the most suitable mechanism for China's energy co-opetition may be multilateral in nature. Current existing energy mechanisms may be available to China, but may not be suitable. It lies with China to choose

whether or not to test these mechanisms – different mechanisms may suit different countries. A further option could be the creation of new mechanisms in which China holds greater sway.

In the case of China and Japan, a bilateral energy mechanism is clearly unlikely to occur. It is even difficult for the dyad to make initial commitments, let alone build a strong and lasting mechanism for cooperation. The Institute of Energy Economics (2004), as cited in Section 4.2.5, suggested that it would be easier for Japan to help maintain regional security in Asia if it were to join a multilateral energy mechanism. Japan would be able to ensure energy supply, contribute to securing energy transportation, and work with other countries to abolish the Asia premium on energy.

In the case of China and Russia, bilateral cooperation has become increasingly more positive despite many hiccups along the way. That does not mean to say that Sino-Russian energy relations would not benefit greatly from the establishment of, or participation in, an energy mechanism. China has already joined existing mechanisms which go some way to monitoring energy, namely the SCO and APEC. According to the examples given in Section 5.2.5 of the price-setting mechanisms in both the SCO and APEC, it is evident that China stands to gain more in the SCO. China has more power over discourse in this multilateral mechanism and can therefore work to obtain more interest.

The third case, that of China and Africa, once again appears similar to that of China and Russia. Entering into a multilateral energy mechanism

would also be beneficial to both China and Africa. As identified in Section 6.2.5, greater governance and monitoring by an impartial multilateral mechanism can ensure a higher level of transparency. This would be beneficial to the Chinese government in that it would help convince others of the benevolence of its intentions, and stamp out accusations of neo-colonialism or corruption in governance and infrastructure investment programmes. Although this opportunity for transparency may be very much welcomed by China, it might be wise for any mechanism put in place not to mirror a mechanism like OPEC. Although OPEC works for a collection of producer countries, allocating quotas amongst African countries may result in a betrayal of price mechanism commitments due to the different stages of production across the continent. Furthermore, OPEC's current strategy is driving prices down, which would not benefit under-developed African economies dependent on the energy boom.

Even if entering into multilateral agreements has a variety of different benefits depending on the case at hand, including regional security, maintaining current good progress, and raising levels of transparency, this research has also repeatedly stressed that the more players in the game, the greater the uncertainty. In other words, a poorly managed multilateral energy mechanism may well be less stable than a bilateral energy mechanism between two closely interdependent countries. That said, it has also been shown that a bilateral energy mechanism is practically an impossibility between symmetrical players, and so a multilateral mechanism is the only

solution in this case (aside from no monitoring by the international regime at all). For asymmetrical pairs, situations are in constant flux, and a multilateral mechanism can help reduce the onus on two bilateral players. In reality, the choice between a bilateral or multilateral energy mechanism is decided by the players' resources, power, and objectives. In China's case, multilateral mechanisms seem to offer a greater degree of benefit than sticking only to bilateral agreements, and this insight may dictate the future scope of China's energy security co-opetition.

To conclude, the five aspects of the PARTS model (Players, Added value, Rules, Tactics, and Scope) are all closely interconnected, and only a synthesised understanding of the factors can draw the full picture of China's co-opetition. Recognising the involvement and role of the players in a game is a precondition to the game of co-opetition. Added value through a high level of multifaceted complementarity can bolster co-opetition by retaining a balance between players, ultimately deciding the size of the pie, or the total common interests, of the players. Rules, here described as commitments and reciprocity, allow for the continuing success of co-opetition through trust-building and deepening of mutual understanding in repeat games. Tactics may be adapted flexibly to different players, and do not need to be rolled out rigidly across the board. This flexible choice of tactics is influenced by both current conditions and historical influences. Finally, in terms of scope, bilateral and multilateral energy mechanisms provide a way to monitor the continuing

progress of co-opetition, but this will depend on the power and resources of the players in the game. It is argued that by applying the insights of the PARTS model, Chinese energy security policymakers will have a deeper understanding of the dynamic of co-opetitive relations and the interaction between the various players in a game. A more comprehensive understanding can assist in the creation of suitable and effective strategies for energy security.

7.3 How *Hehe* Culture Contributes Unique 'Chinese Characteristics' to Co-opetition

The previous section gave a comprehensive overview of co-opetition according to the PARTS model, and offered specific insights into China's co-opetition with three specific partners: Japan, Russia and Africa. It has been emphasised that co-opetition is most readily achieved between asymmetrical players, and that the inclusion of fewer players can secure the stability of the co-opetition. Increasing added value by harnessing multifaceted complementarity is extremely beneficial, and following the rules of commitments and reciprocity can ensure co-opetition is long-lasting and steady. Many tactics are open to China, and these were discussed at length in the case studies. China also has the choice of entering into or even creating mechanisms to monitor relations, and it has been shown that multilateral

energy mechanisms may be the most beneficial for China's current energy security situation. Through this paper, the three cases have been explored in full, but it is now important to note that these findings can be generalised out to other players. In particular, co-opetition can be achieved most easily with asymmetrical players, and there are many options in the world for China, including Middle Eastern energy-producing countries. But what distinguishes China's policies and strategy of co-opetition? The answer is China's traditional *Hehe* culture. Adherence to the tenets of *Hehe* culture can help increase trust between asymmetrical players, and the maintenance of good relations will help this develop ever more quickly. Secondly, Hehe culture is part of Chinese heritage, and it has influenced foreign policy over a long period of time. The evolution and development of China's energy policies also reflect the significant role *Hehe* culture has played over time, and its consistent inclusion in energy policy underlines the continuity of this cultural influence, suggesting that it will continue to last into the future. The following section will analyse how *Hehe* culture shapes China's co-opetition.

7.3.1 How *Hehe* Culture Shapes China's Co-opetition

The fundamental principles of *Hehe* culture are *harmony is precious* and *harmony without sameness.* (Zhang, 2011) Both of these points are in fact reflected in the rules aspect of co-opetition in the PARTS model, which

highlights both commitment and reciprocity. These aspects are closely tied to the idea of harmony. As discussed in Section 2.2, the most difficult aspect behind establishing commitments is the challenge of building real and lasting trust between players. *Hehe* culture guides China to respect players, even if they have different approaches to China, and emphasises harmony above all. Open adherence to the tenets of this culture can be a persuasive tool for the increasing of mutual understanding – unconditionally – and building trust, based on harmony, between players.

Section 7.1 analysed how co-opetition shapes China's energy security strategy by re-framing competition as an opportunity for integration, reducing the over-emphasis on threat, and instead stressing the chance to build interest by integrating resources. *Hehe* culture goes one step further to weaken the conflictual and threatening nature of competition, as it demands that unity and harmony are paramount. Thus, China's energy security is shaped by commitment to co-opetition, and this co-opetition is itself furthered by *Hehe* culture.

There are certain examples in the case studies to demonstrate the Chinese government's application of *Hehe* culture to co-opetition. Admittedly, it has not always been successful, demonstrating that *Hehe* culture is not fool proof in the face of other factors. For instance, in the case of China and Japan, the two countries are symmetrical in terms of energy and it has been reiterated that there is little scope for long-term or even fleeting co-opetition between

such a dyad. Yet the Chinese government has consistently proposed a stance of peace and harmony to deal with relations with Japan, which can be identified in official policies and meetings, including the *China Joint Declaration on Building a Partnership of Friendship and Cooperation for Peace and Development.* (Ministry of Foreign Affairs of Japan, 1998a) This has allowed brief periods and projects of cooperation. However, a number of issues have arisen which have usurped the benevolent influence of *Hehe* culture. Wrangling over territory, influenced by the framing of energy as a private good, the tense historical relations between China and Japan have put a stop to the period of positive cooperation. Co-opetition on energy exploration has not succeeded, and the fundamental reason is the lack of trust. *Hehe* culture, in this case, has not been able to overcome the angst between Japan and China. Although documents and policies demonstrate that both China and Japan would like to keep the peace and respect their differences, the ultimate failure to work together to build co-opetitive commitments reveals that neither side will give up on a private good, nor will they be swayed from their positions informed by historical acrimony. Nevertheless, where energy is not seen as a private good, in the case of renewable energy and green energy choices, co-opetition is more successful. Although working together on energy reserves and emissions reduction is a secondary issue to that of securing supply and demand, the two sides have a higher degree of complementarity in this area, and due to the commitment to harmony despite differences – or even conflict –

elsewhere, the two sides are attempting to cooperate in this regard. The soft power of *Hehe* culture is not enough to overcome the lack of trust in Sino-Japanese relations, but it has helped prevent a total lack of cooperation.

However, the Sino-Russian case is entirely different. *Hehe* culture here is able to help the two sides increase their level of trust. Although according to assumption three building trust is difficult, and this leads to the failure of co-opetition. *Hehe* culture compensate for this. When Putin first came to power, as mentioned in Section 5.1.2, Russian relations with the West were weak and Russia began to turn towards the East. (Jaffe and Manning, 2001; Ministry of Energy of the Russian Federation, 2010) The starting point of closer Sino-Russian relations came from two key points in *Hehe* culture: harmony and mutual respect. In spite of the many reservations of Western countries, China continued to respect Russia as a partner and adhered to the idea of harmony even in the case of differences. This is also reflected in the flow of bilateral energy cooperation meetings in the following years. It can be concluded that the declarations and cooperative dialogues were based on these tenets. *Hehe* culture was a significant factor in the initiation of a new, closer stage of co-opetition between the two countries, as Russia saw that China could be a trusted partner. Trust has continued to develop within this virtuous circle, enabling long-term co-opetition. Co-opetition between the two is not a one-off deal; it is long-term and steady, and this has been supported by the two sides' observance of *Hehe* culture. The new period of strategic

partnership indicates the blossoming trust and mutual understanding – precisely what *Hehe* culture aims to nurture.

Once again, the situation with China and Africa is similar to that of China and Russia. *Hehe* culture has once again played a significant role in establishing trust between the players. The trajectory of good relations over generations has been evidenced through history, in direct contrast to the Sino-Japanese trend. Section 6.1.2 showed how good relations began right from the founding of modern China, throughout Mao's era and up to the present day Both sides have agreed to maintain harmony and respect each other's differences in future co-opetition, as outlined in, for instance, the basic guidelines of FOCAC. (Xinhua News Agency, 2000) No obvious disputes, historical or contemporary, upset the application of *Hehe* culture to Sino-African co-opetition. China has cooperated successfully with African countries and has presented Africa with a large supply of aid for a long duration. China's fundamental objective in aiding and cooperating with Africa is ostensibly to help Africa to achieve independent development. (Moyo, 2010) The Chinese government gave unconditional aid to Africa on a range of fields including technology, education and health training. (Yang, 2011)

However, there is one major issue besetting the application of *Hehe* culture to China's co-opetition with Africa. In fact, China has adhered very closely to the ideas inherent in *Hehe* culture, respecting counterparts, refusing to interfere in domestic political situations and supplying aid without attached

conditions. So well has China done in this regard, that other countries accuse the Chinese government of acting irresponsibly by propping up corrupt and tyrannical regimes, and of extending a pattern of neo-colonialism across the continent. Although the Chinese government believes it has been sticking to principles of cooperation that have evolved from *Hehe* tradition, this has been misconstrued as China throwing its weight around to obtain one-sided benefit. The lack of transparency in Sino-African relations is hindering the progress of co-opetition (Lyman, 2005), but this lack of transparency comes about in part due to China's commitment to mutual respect, harmony and non-interference as derived from *Hehe* culture. Nevertheless, Chinese aid to Africa is popular precisely because no conditions are attached; China respects the differences between itself and its cooperative partners, including African countries, and commits to harmony without sameness. By offering aid without conditions, the Chinese government is not forcing the African hand, or demanding ideological unity before proffering assistance, but is allowing African countries to take their own path to development. *Hehe* culture is therefore beneficial to the two parties involved, though it may attract outside scrutiny which cannot be overlooked.

China's legacy of *Hehe* culture continues to play an important role in China's modern day relations. In terms of the cases discussed in this research, evidence of *Hehe* culture is apparent in all three. However, it has only had limited success in Sino-Japanese relations, in the face of symmetry, historical

rancour and the framing of energy as a private good. In asymmetrical relations, *Hehe* culture fares better, building trust, helping both initiate and maintaining co-opetition and shaping it into a particular approach replete with these traditional Chinese characteristics.

7.3.2 The Continuous Thread of *Hehe* Culture

The previous section discussed the influence of *Hehe* culture on China's co-opetition, and this section will address the continuous thread of *Hehe* culture through time, drawing together these two points to show how *Hehe* culture lends China's co-opetition certain unique Chinese characteristics.

The heritage of *Hehe* culture has been manifested in different energy policies across the different eras of different leaders. This is the result of the rational development of *Hehe* culture. Mao proposed the policy of self-sufficiency, which unfortunately was extremely detrimental to cooperation. However, in Mao's era, it was more a question of cooperating deeply with certain actors rather than others. This was due to both ideological reasons and the wider political conditions of the time. However, considering Mao's arguments and the speech he gave to African leaders in 1977 (Mao, 1977a; Mao, 1977b), it can be identified that he was dedicated to the tenets of *Hehe* culture within the limited cooperative relations that China enjoyed. In other words, although there is scant indication of any commitment to *Hehe* culture in

China's relations with most countries, there is a wealth of evidence of the application of *Hehe* culture to China's cooperative relations with Africa during this era. Mao focused more strongly on communist ideology and class struggle than later leaders, and regardless of whether this is seen as right or wrong, there is no doubt that it undercut the influence of *Hehe* culture. *Harmony without sameness* was swept aside for ideological reasons in relations with many countries. And yet, both *harmony without sameness* and *peace is precious* feature in early Sino-African relations, which shows the discrepancy in the consistency of Mao's policies.

Deng reduced the attention on class struggle to a massive extent, and began to cooperate with developed countries. The start of the *Opening Up and Reform* allowed China to begin integrating with a wider range of countries, including those with ideological differences. (Deng, 1993b) Thus there was considerable progress in the Chinese government's application of *Hehe* culture to foreign relations and energy policy. In particular, China began to adhere to the idea of *harmony without sameness* by overlooking ideological and regime differences, as well as to *peace is precious* by shelving territorial disputes to allow cooperation. At this point, the influence of China's *Hehe* culture began to spread to a wider scope.

In the rule of Jiang Zemin, there were many cases that hinted at the contribution Hehe culture played in China's development. It was only with strong commitment to trust-building and the construction of common interests

that China was able to succeed in new efforts at cooperation, such as the examples of Sino-Russian cooperation given in Chapter Five. Following this, under Hu Jintao, the racing pace of development highlighted the resounding success of the *let the advanced in* policy. (Information Office of the State Council of the People's Republic of China, 2011) During this period, the seeds of cooperation that were sown in previous eras began to bear fruit and co-opetitive relations began to be consolidated and reinforced. One hindrance to this was that the high speed of China's development and the obvious reaching influence of the huge nation began to raise doubts about the nature of China's development, out of which arose the China threat theory and debates over China's ostensible commitment to peaceful development. However, according to the guidelines of *Hehe* culture, the Chinese government advocates peace not only domestically but also across countries in the world. The Chinese government has consistently declared peaceful intentions, reiterating that countries should not interfere in each other's affairs, and that China reciprocally will not use its influence for anything other than benevolent means. As *Hehe* culture existed throughout the three periods of leadership before Hu, it was inevitable that Hu would continue this legacy and negate suspicions of China's threat to others.

The application of China's *Hehe* culture to co-opetition in energy policy has evolved through different stages, from a mere seed to the first shoots of progress, then from careful nurturing and growth through to the

positive harvest seen today. These four stages neatly match up with the four successive leaderships of Mao, Deng, Jiang and Hu respectively. When conditions have been conducive, the success of Chinese *Hehe* culture has flowed naturally, but this hasn't been an immediate process. Although *Hehe* culture was proposed by ancient Chinese philosophers, it is in the globalised, interdependent modern world that it has achieved its greatest application. Consequently, the *Hehe* culture seen in China's policy today has been drawn from the original tenets to fit the co-opetition of today, leaving the legacy of both tradition and modernity and stamping unique Chinese characteristics on China's co-opetition.

7.4 Conclusion

This research has been broken down into seven chapters. The first chapter introduced the problems plaguing China's energy security, stating that the primary issue is that supply is unabatingly at risk of falling short of demand. This situation pushes China to continuously increase imports, and this unavoidable reliance on the often unsecure supplies of producer countries leaves China's security at a precarious impasse. Other than this major problem, China is also facing secondary issues, for example constructing energy reserves, securing energy transportation and working towards emissions reductions. These secondary issues in fact all stem back to the

primary issue. Due to the unsustainable and unstable current energy structure, China is aiming to diversify away from fossil fuels. Reliance on fossil fuels is adding to the stakes of unsafe crude oil transportation through the Malacca Straits, leaving China at the mercy of pricing policies and causing huge emissions of greenhouse gases.

Faced with this somewhat critical scenario, China has little choice but to seek alternative options. The increasing interdependence between countries in the globalised world encourages China to cooperate more closely with other actors to more effectively utilise available energy or develop alternative sources. However, competition does not cease, and inevitably will not do so given the nature of global energy security and international relations. This research argues that co-opetition, by integrating both inevitable competition and beneficial cooperation, offers the best option for resolving or at least reducing the major problems of China's energy security. The second chapter introduced the concepts of co-opetition and *Hehe* culture, explaining the close link and similarities between the two. Further to this, co-opetition was located within the insights of game theory and the PARTS model, which includes Players, Added value, Rules, Tactics and Scope. The existence of players and added value (through complementarity) are the necessary prerequisites for co-opetition, and the latter three aspects – rules (namely commitment and reciprocity), tactics and scope – are conditional on the existence of these two. As a result, it is useful for China to identify the players

in a game, as well as the prospects for added value, in order to shape successful rules, tactics and scope for co-opetition.

The third chapter introduced China's foreign and energy policy over time, and outlined how co-opetition had been applied to energy security thus far. It was shown that there has been evidence of co-opetition over time, but that this could be developed to a higher degree in order for China to reduce the burden of energy security even more. This research then moved on to three case studies in order to show the progress of co-opetition between China and three different global actors over time, pinpointing the successes and failures as well as the reasons behind them, and offering suggestions for future scope based on the insights of the PARTS model.

The three case studies looked at Japan, Russia and Africa in turn. The PARTS model suggests that the two aspects of players and added value are the prerequisites for co-opetition, but discussion of the cases over Chapters Four, Five, and Six revealed that the only difference between reality and the five assumptions in Chapter Two is the evidence of strong rules. The *Hehe* culture inherent in China's policy pushes the aspect of establishing rules as a third required aspect. Building up commitment and reciprocity is supplementary for co-opetition, and yet Chinese foreign energy policy is dedicated to building trust and therefore oiling the wheels of commitment and reciprocity. This is the legacy of *Hehe* culture at work, imbuing China's energy security with unique Chinese characteristics. Analysing the findings of the

cases shows that *Hehe* culture can indeed help China build up trust with partners, initiating or maintaining commitments. In the case of asymmetrical players, this is a largely successful strategy, though it does not work so well with symmetrical partners.

Co-opetition as an approach has played an important role in facing China's energy security and has created a better platform for all parties involved. Besides this, Co-opetition is helping China re-generate the way energy security is viewed. No longer does energy security need to be seen as a growing list of problems and threats; instead China can use the strategies of co-opetition to grasp the opportunities afforded by integration and interdependence. Combining the positive traits of co-opetition with the special function that *Hehe* culture plays in China's approach to cooperation and integration with other nations, it can be said that the strategic value of co-opetition is helping China to generate a new energy security outlook with Chinese characteristics. Thus the offering of co-opetition, combined with Chinese *Hehe* culture, to western academia as an approach to energy security is the original contribution of the whole research.

Certainly, this is an attractive and feasible option for China. But how far can Hehe culture go in the international world? Will this co-opetition with Chinese characteristics be well-accepted by other countries? There is no doubt that there are still many issues to be addressed even by China; as this research has shown, even China's relations with Russia and Africa are

hindered by difficulties despite the overall success of their co-opetitive efforts. With the continuous reduction in energy prices and the introduction of western sanctions, Russia has been hit hard. Should the Chinese government help Russia pass through this crisis or quietly wait to see developments? Will the decision at this time influence the outcome of reciprocity in Sino-Russian co-opetition? In Africa, how does China balance re-gaining trust and shutting down allegations of neo-colonialism whilst remaining true to the teachings of *Hehe* culture? As for relations with Japan, efforts to cooperate on energy have been growing more and more tense, and China must now decide whether to keep the softly, softly approach of *Hehe* culture, or turn to a harder power option.

A vast array of questions still need to be considered by Chinese policymakers, but there is no doubt that the legacy of *Hehe* culture will continue to be seen, and that the practical contribution of co-opetition offers one of the best solutions to China's energy security dilemmas. The continuing shift in conditions across the world will shape the path that energy policy takes, and this will remain an interesting direction for future research for much time to come.

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